Injection into EMMA, septum and kicker settings

F. Méot

CEA/DSM/IRFU & CNRS/IN2P3
LPSC, UJF Grenoble 1, CNRS/IN2P3, INPG
53 Avenue des Martyrs, 38026 Grenoble cedex

March 2010

Abstract

Injection in EMMA, septum and kicker settings at various energies from 10 to 20 MeV. Hard edge magnet representations.

Contents

1   Introduction

This report concerns the setting of the septum (Sep) and two kickers ($K1$, $K2$) in the injection section of EMMA ring.

It is long because it contains

(i) all useful zgoubi data files, so to allow reproducing the results shown, or studying different conditions of lattice, beam, etc.

(ii) coordinates of injection orbits at several energies, so to allow plotting the injection paths on "engineer drawing", and thus check the geometrical acceptance

• EMMA baseline lattice, "070221b", is considered here, with in particular quadrupole displacements
   xd = +3.404834122312866 cm
   xf = +0.7513707181808552 cm
with respect to the polygon edge as schemed (Figs. 1).

• For a series of energies, the two kickers $K1$, $K2$, are "matched" (using 'FIT2' in Zgoubi [1, pp. 54, 194]), the constraints being the closed orbit coordinates right upstream of the corner angle at entrance to the QD which follows the second kicker, $K2$ (Fig. 1).

• The septum field is imposed three different values : two extreme ones, 'extreme' in the sense that they have the property of yielding maximum field in one or the other of the two kickers (kicker field assumed limited to about B_{K1}, $B_{K2} \in [-0.7, +0.7]$ kG), and a median value taken between theses two extremes. This is sufficient to conveniently allow parabolic interpolation of arbitrary triplet value (B_{Sep},B_{K1},B_{K2}), which can in any case at least serve as a starting point for further interpolation using Zgoubi.

• The starting point of the injection section considered is taken at entrance to Sep. The coordinates of the intersection with the optical axis there are $(x_{Se,i}, x'_{Se,i}) = (9.95cm, 65deg)$ with respect to $K1$'s polygon edge, see Fig. 2.

A principle scheme of the location of the optical elements and of the orbit geometries as obtained from the simulations discussed in this report is shown in Fig. 3.
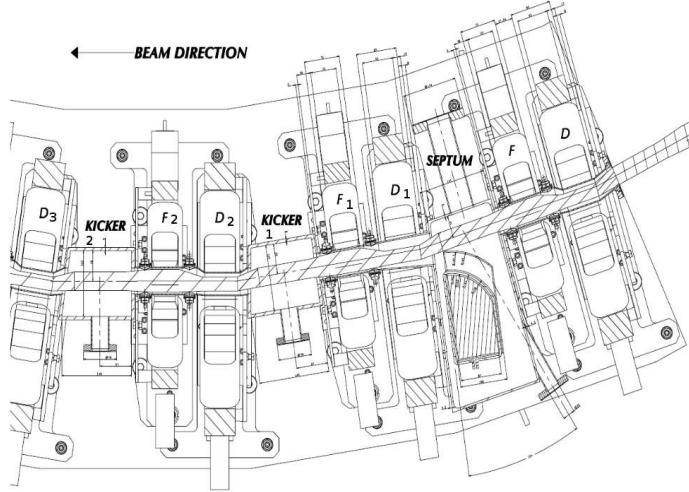
Figure 1: EMMA injection region and notations used in the text.
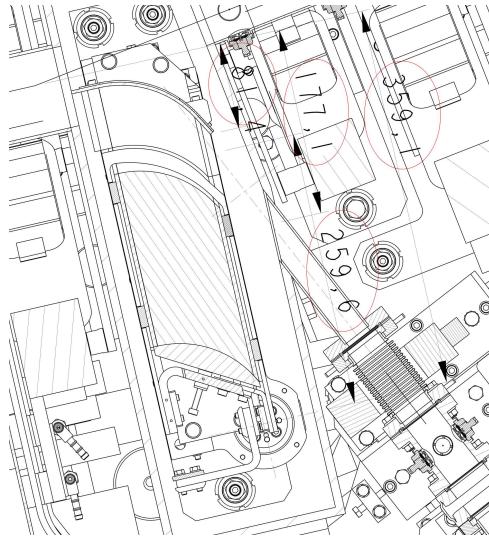
Figure 2: EMMA injection septum region, with distances.
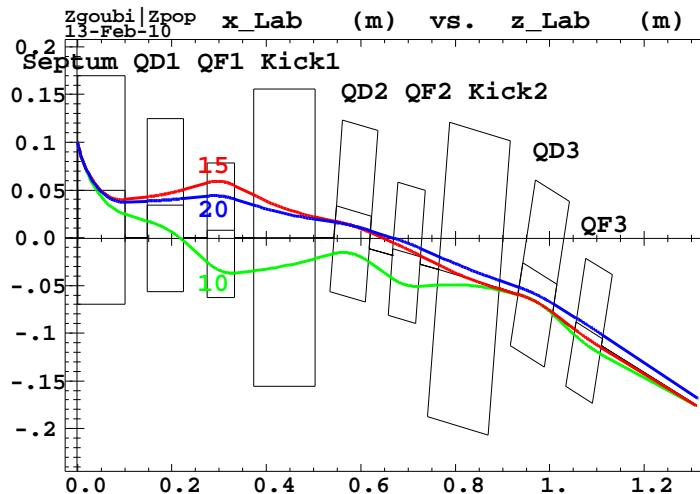
Figure 3: Injection orbits. Coordinates in the present report are taken with respect to the polygon side containing the 'QD1 QF1' cell (the very line *wrt.* which QD and QF are shifted by respectively xd = +3.404834122312866 cm, xf = +0.7513707181808552 cm).

All injection orbits emerge from the injection line at the left hand side of the plot (Z_Lab=0), with X_Lab=9.95 cm and a 65 degrees angle *wrt.* the polygon edge.

2 Orbits

• The various settings of septum and kickers as derived from the matching are given in Tab. 1.

• Figs. 4-10 show the injection orbits at 10, 12, 14, 15, 16, 18 and 20 MeV. Each graph displays three injection orbits, corresponding to three different values of the Sep field, B_{Sep} (two 'extremes' and one in between).

• Zgoubi data files are given in App. A.

• Closed orbit conditions (the constraints in matching B_{Sep}, B_{K1}, B_{K2}) are given in App. B.

• The coordinates of all the trajectories of Figs. 4-10 are given in App. C, in view of further reproduction on "engineering plans".

Table 1: Sep, $K1$ and $K2$ settings, corresponding to the orbits in Figs. 4-10. *Note :* these data are a copy-paste of a "matching" output, the sole values tagged "Kick1", "Kick2" need be taken into account.

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
20MeV
b-septum=-6.6kG    -> limit is kicker strength
   14    1    4  -0.700     -0.541     -0.2175811188 =Kick1   0.700     4.441E-16
   24    2    4  -0.700     -0.114     -0.4298120679 =Kick2   0.700     5.551E-17
b-septum=-6.35kG
   14    1    4  -0.700     -0.218     -0.4177002755 =Kick1   0.700     1.110E-16
   24    2    4  -0.700     -0.430     -0.2329649441 =Kick2   0.700     2.776E-17
b-septum=-6.1kG   -> limit is kicker strength
   14    1    4  -0.700     -0.541     -0.6233911364 =Kick1   0.700     6.661E-16
   24    2    4  -0.700     -0.114     -3.3741650634E-02 =Kick2 0.700    7.633E-17
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
18MeV
b-septum=-6.2kG    -> limit is kicker strength
   14    1    4  -0.900     -0.180     -0.1775057858 =Kick1   0.900     5.551E-17
   24    2    4  -0.700     -0.620     -0.6240137448 =Kick2   0.700     2.220E-16
b-septum=-5.8kG
   14    1    4  -0.900     -0.490     -0.4258981463 =Kick1   0.900     3.331E-16
   24    2    4  -0.700     -0.230     -0.3119671283 =Kick2   0.700     1.332E-15
b-septum=-5.4kG    -> limit is kicker strength
   14    1    4  -0.900     -0.690     -0.6940861941 =Kick1   0.900     7.772E-16
   24    2    4  -0.700      0.00      6.9288734007E-03 =Kick2 0.700    3.286E-15
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
16MeV
b-septum=-5.6kG    -> limit is kicker strength
   14    1    4  -0.900     -0.360     -0.3565203790 =Kick1   0.900     6.217E-15
   24    2    4  -0.700     -0.634     -0.6345255732 =Kick2   0.700     1.521E-14
b-septum=-5.1kG
   14    1    4  -0.900     -0.570     -0.5570664418 =Kick1   0.900     3.553E-15
   24    2    4  -0.700     -0.250     -0.2467676300 =Kick2   0.700     9.520E-15
b-septum=-4.6kG    -> limit is kicker strength
   14    1    4  -0.900     -0.670     -0.789811378 =Kick1    0.900     4.441E-16
   24    2    4  -0.700     -0.160      0.155328657 =Kick2    0.700     1.277E-15
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
15MeV
b-septum=-5.2kG    -> limit is kicker strength
   14    1    4  -0.700     -0.646     -0.4952723614 =Kick1   0.700     1.760E-14
   24    2    4  -0.700      0.169     -0.5533705069 =Kick2   0.700     1.288E-14
b-sep = -5kG
   14    1    4  -0.700     -0.646     -0.5431651166 =Kick1   0.700     1.554E-14
   24    2    4  -0.700      0.169     -0.4002465829 =Kick2   0.700     1.077E-14
b-sep=-4.7kG   -> limit is kicker strength
   14    1    4  -0.700     -0.646     -0.6342251672 =Kick1   0.700     8.882E-16
   24    2    4  -0.700      0.169     -0.1656477872 =Kick2   0.700     5.829E-16
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
14MeV
b-septum=-5.1kG   -> limit is kicker strength
   14    1    4  -0.900     -0.620     -0.6368152464 =Kick1   0.900     2.127E-02
   24    2    4  -0.700     -0.610     -0.6869140508 =Kick2   0.700     3.203E-02
b-septum=-4.6kG
   14    1    4  -0.900     -0.670     -0.642540813 =Kick1    0.900     2.220E-16
   24    2    4  -0.700     -0.160     -0.313724251 =Kick2    0.700     3.331E-16
b-septum=-4.2kG   -> limit is kicker strength
   14    1    4  -0.900     -0.520     -0.7047705196 =Kick1   0.900     3.331E-15
   24    2    4  -0.700      0.00      1.5027153436E-03 =Kick2 0.700    4.888E-15
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
12MeV
b-septum=-3.5kG    -> limit is kicker1 strength
   14    1    4  -0.900     -0.100     -0.6735911593 =Kick1   0.900     7.772E-15
   24    2    4  -0.900      0.200      0.1139674350 =Kick2   0.900     3.719E-15
b-septum=-3.1kG
   14    1    4  -0.900     -0.398     -0.4807337595 =Kick1   0.900     1.282E-14
   24    2    4  -0.900      0.530      0.4468260810 =Kick2   0.900     5.329E-15
b-septum=-2.8kG   -> limit is kicker1 strength
   14    1    4  -0.900     -0.398     -0.1424546679 =Kick1   0.900     2.739E-14
   24    2    4  -0.900      0.530      0.6953180021 =Kick2   0.900     8.882E-15
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
10MeV
b-septum=-2.9kG   -> limit is kicker strength
   14    1    4  -0.700      9.108E-02 -0.5589141982 =Kick1   0.700     1.554E-15
   24    2    4  -0.700      0.490      0.1763185771 =Kick2   0.700     5.551E-17
b-septum=-2.65kG
   14    1    4  -0.700      9.108E-02 -0.2156519958 =Kick1   0.700     2.484E-14
   24    2    4  -0.700      0.490      0.3804271955 =Kick2   0.700     5.018E-14
b-septum=-2.4kG    -> limit is kicker strength
   14    1    4  -0.700      9.108E-02  0.3856279358 =Kick1   0.700     3.775E-15
   24    2    4  -0.700      0.490      0.5392169561 =Kick2   0.700     7.883E-15
```
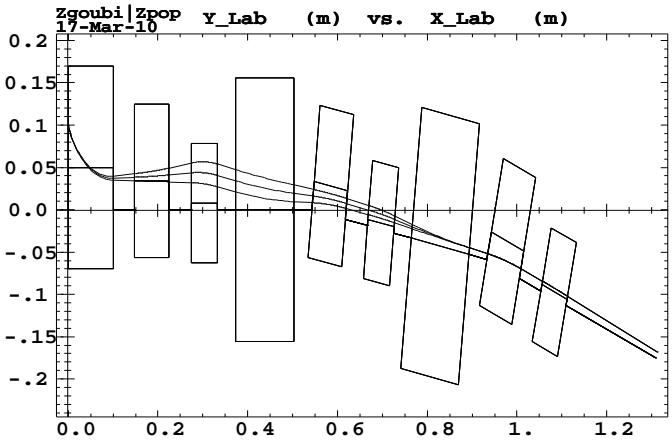
Figure 4: 20 MeV.
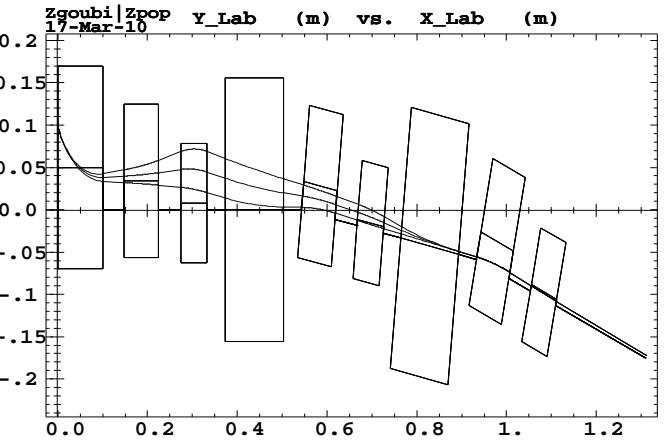
Figure 5: 18 MeV.
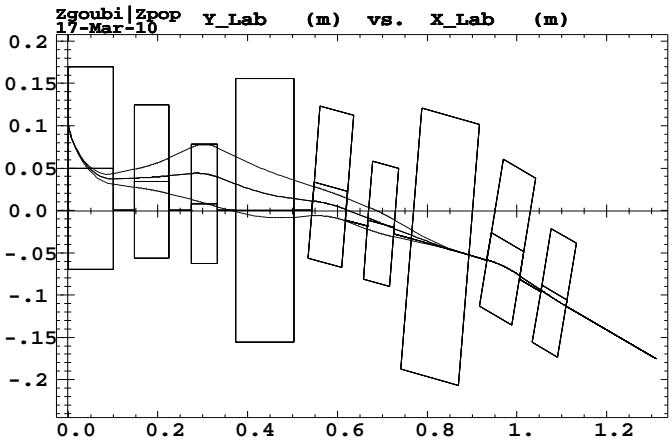
Figure 6: 16 MeV.
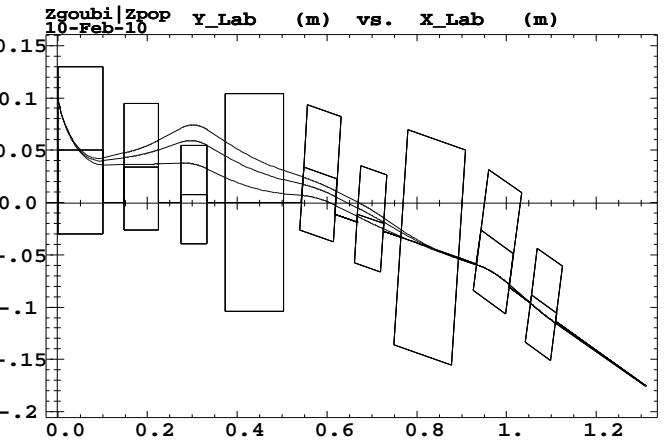
Figure 7: 15 MeV.
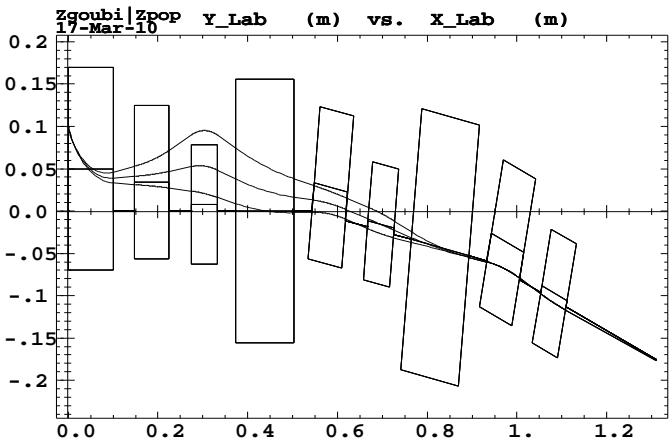
Figure 8: 14 MeV.
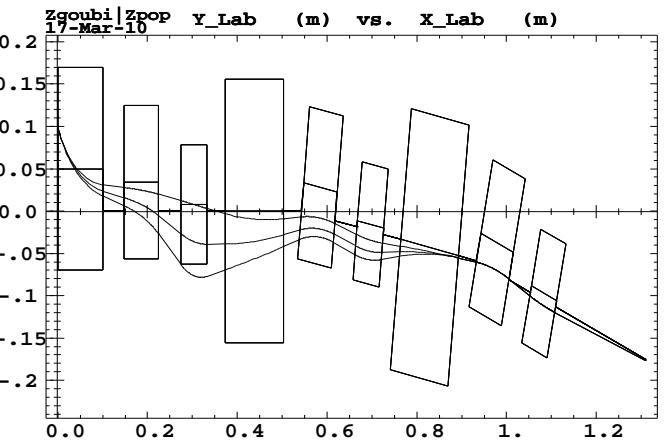
Figure 9: 12 MeV.
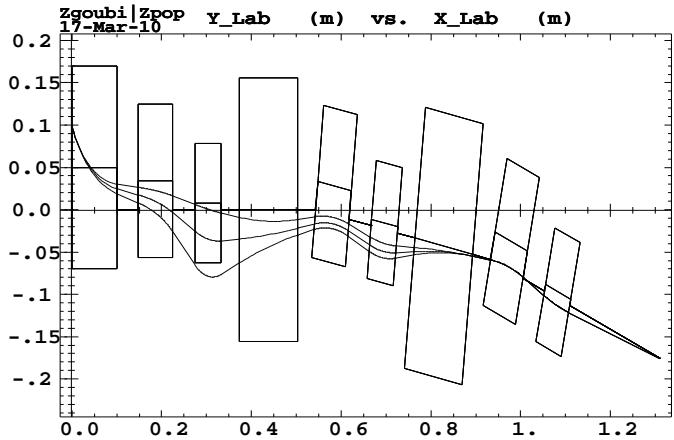
Figure 10: 10 MeV.

3 Focusing

• This Section gives the ellipse conditions at the entrance face to the septum, i.e. at the upstream end of the injected orbits as discussed in the previous Section.

• These initial conditions ensure periodic focusing conditions at the downstream end of the injected orbits, right upstream of the corner angle at entrance to the QD which follows the second kicker, $K2$(Fig. 1). Periodic conditions at that location are given in App. D.

• Ellipse conditions at septum entrance *wrt.* injection line axis are obtained by backward ray-tracing. Results are given in Tab. 2.

• Template Zgoubi data files are given in App. E.

• Figs. 11, 12 display typical beam envelopes and invariants.

Table 2: Ellipse conditions at injection point (intersection of axis of injection line from ALICE with septum entrance face of septum), with injection line from ALICE as reference axis.

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
20MeV
Beta_x, Alpha_x:   0.137477    1.42677
Beta_z, Alpha_z:   0.336787   -7.35879


%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
18MeV
Beta_x, Alpha_x:  0.133468     1.54024
Beta_z, Alpha_z:  0.263394    -5.93581


%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
15MeV,  B_septum=-5kG
Beta_x, Alpha_x:   1.3168E-01   1.8588E+00
Beta_z, Alpha_z:   1.2743E-01  -2.9618E+00


%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
12MeV
Beta_x, Alpha_x:   0.290866  4.44236
Beta_z, Alpha_z:   0.181961  -3.72104


%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
10MeV
Beta_x, Alpha_x:   0.622705      10.2042
Beta_z, Alpha_z:   2.656359E-02  -0.417906
```

15 MeV

Horizontal
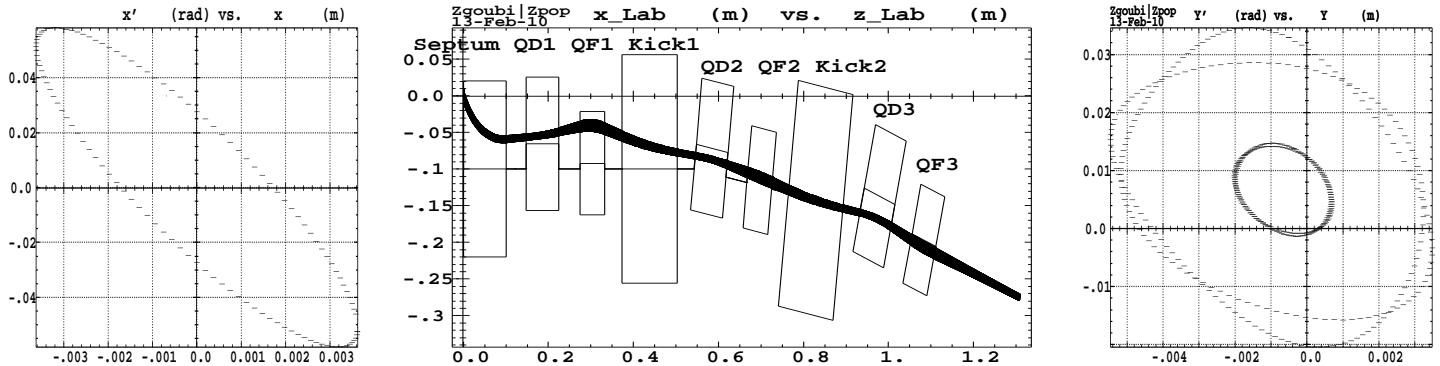
Figure 11: Central plot : horizontal beam. Left : $\epsilon_x = 100\,\pi$mm.mrad injected invariant, at entrance to septum. Right : shape of the $100\,\pi$mm.mrad invariant at entrance to QD2 and QD3. A 10 times smaller invariant yields quasi-identical, quasi-ellipse shapes at QD2, QD3 entrance.

Vertical
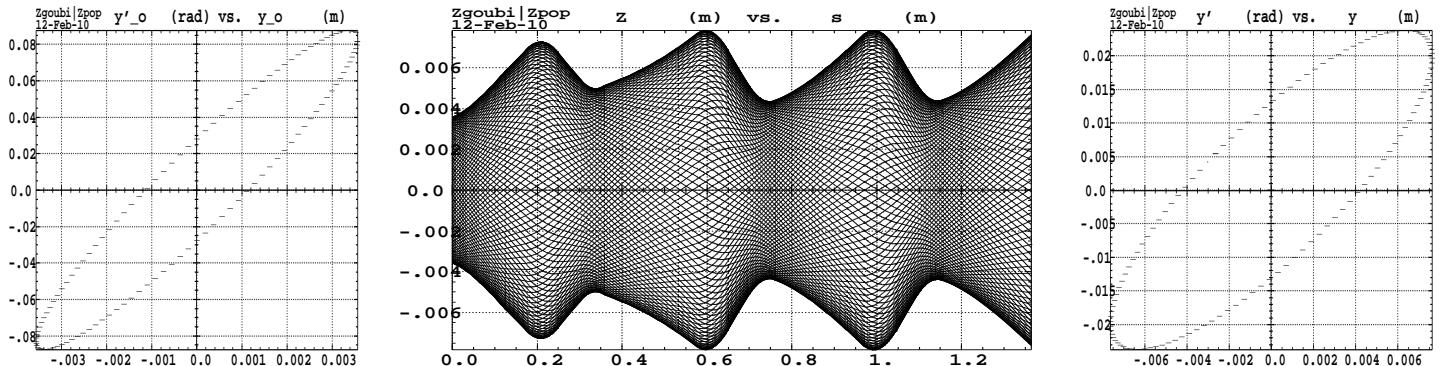
Figure 12: Central plot : vertical beam. Left : $\epsilon_y = 100\,\pi$mm.mrad injected invariant, at entrance to septum ; right : periodic invariant at entrance to QD.

APPENDIX

A Zgoubi data files for computing injected orbits

20 MeV

```
Data generated by searchCO
'OBJET'                                                                                    1
5.171103865922e+01
2
 1 1
 9.95  -1134.46E+00  0.0E+00  0.0E+00  0.0E+00  1.32265940E+00 'i'        20.000000 MeV
  1 1 1 1 1 1 1 1 1 1
    'PARTICUL'                                                                             2
    5.10998920e-01 1.602176487e-19 1.159652181100e-03 0.00e+00 0
    'FAISTORE'                                                                             3
    b_zgoubi.fai
       1
    'FAISCEAU'  ! theor. beam position/angle *Check* : ~-9cm/65deg. (1134.4640mrad)        4
  'COLLIMA'                                                                                5
   1
  1.1  8.14  11.76 -999. 999.
    'MULTIPOL' septum                                                                      6
    002   .plt
  10.  10.  -6.1  0.  0. 0. 0. 0. 0. 0.
    0. 0.  1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4 .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0. 0.  1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4 .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
    #320|20|320
    2  0.00e+00  5.  0.00e+00
    'DRIFT'    dr .plt     ! distance to septum exit                                       7
    2.1011412
    'DRIFT'    dr .plt        ! distance to septum vessel opening                          8
    2.7151711
    'MULTIPOL' QD                                                                          9
    002   .plt
    7.569871747666486  5.30e+00  0. -2.49324632276342185  0. 0. 0. 0. 0. 0. 0. 0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4 .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4 .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
    #320|76|320
    2  0.00e+00  3.404834122312866 0.
    'MARKER' BPM2 off                                                                     10
    'DRIFT' sd                                                                            11
    5.00e+00
    'MULTIPOL' QF                                                                         12
    002   .plt
    5.878241131662439  3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4 .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4 .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
    #320|59|320
    2  0.00e+00  0.7513707181808552  0.
    'DRIFT' ld                                                                            13
    4.
    'MULTIPOL' kicker1                                                                    14
    002   .plt
  13.  10.  -0.6233911364  0.  0. 0. 0. 0. 0. 0. 0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4 .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4 .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
    #320|20|320
    2  0.00e+00  0.  0.00e+00
    'MARKER' dum  .plt                                                                    15
    'DRIFT' ld                                                                            16
    4.
    'MARKER' BPM1 off                                                                     17
    'CHANGREF'                                                                            18
    0.00e+00 0.00e+00 -8.571428571429e+00
    'MULTIPOL' QD                                                                         19
    002   .plt
    7.569871747666486  5.30e+00  0. -2.49324632276342185  0. 0. 0. 0. 0. 0. 0. 0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4 .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4 .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
    #320|76|320
    2  0.00e+00  3.404834122312866 0.
    'MARKER' BPM2 off                                                                     20
    'DRIFT' sd                                                                            21
    5.00e+00
    'MULTIPOL' QF                                                                         22
    002   .plt
    5.878241131662439  3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4 .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4 .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
    #320|59|320
```

```
         2  0.00e+00  0.7513707181808552  0.
         'DRIFT'  ld                                                                   23
          4.
         'MULTIPOL'  kicker2                                                           24
          002   .plt
         13.  10.  -3.3741650634E-02  0.  0.  0.  0.  0.  0.  0.  0.  0.
          0.  0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
          4  .1455    2.2670  -.6395  1.1558  0.  0.  0.
          0.  0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
          4  .1455    2.2670  -.6395  1.1558  0.  0.  0.
          0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
          #320|20|320
          2  0.00e+00  0.  0.00e+00
         'MARKER'  dum  .plt                                                           25
         'DRIFT'  ld                                                                   26
          4.
         'MARKER'  BPM1  off                                                           17
         'CHANGREF'                                                                    18
         0.00e+00  0.00e+00  -8.571428571429e+00
         'MULTIPOL'  QD                                                                19
          002   .plt
         7.569871747666486  5.30e+00  0.  -2.49324632276342185  0.  0.  0.  0.  0.  0.  0.  0.
          0.  0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
          4  .1455    2.2670  -.6395  1.1558  0.  0.  0.
          0.  0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
          4  .1455    2.2670  -.6395  1.1558  0.  0.  0.
          0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
          #320|76|320
          2  0.00e+00  3.404834122312866  0.
         'MARKER'  BPM2  off                                                           20
         'DRIFT'  sd                                                                   21
         5.00e+00
         'MULTIPOL'  QF                                                                22
          002   .plt
         5.878241131662439  3.70e+00  0.  2.47708182137912441  0.  0.  0.  0.  0.  0.  0.  0.
          0.  0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
          4  .1455    2.2670  -.6395  1.1558  0.  0.  0.
          0.  0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
          4  .1455    2.2670  -.6395  1.1558  0.  0.  0.
          0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
          #320|59|320
          2  0.00e+00  0.7513707181808552  0.
         'DRIFT'  ld                                                                   23
      21.
         'MARKER'  dum     .plt                                                        27
        'FAISCEAU'
   'END'

   'FIT2'                                                                              29
    2
   14 4 0.  [-.7 ,.7]        kicker 1
   24 4 0.  [ -.7, .7]       kicker 2
    2
   3 1 2 28   6.973490E-01   1. 0.      position at entrance of Cell (before 2pi/42 angle)
   3 1 3 28  -2.156971E+01   1. 0.      angle    at entrance of Cell (before 2pi/42 angle)
   'END'                                                                               30
```

18 MeV

```
Data generated by searchCO
'OBJET'                                                                               1
5.171103865922e+01
2
 1  1
 9.95 -1134.46 0. 0. 0.  1.19360420E+00 'i'        18.000000 MeV
  1 1 1 1 1 1 1 1 1 1
   'PARTICUL'                                                                          2
    5.10998920e-01 1.602176487e-19 1.159652181100e-03 0.00e+00 0
   'FAISTORE'                                                                          3
    b_zgoubi.fai
       1
  'COLLIMA'                                                                            5
   1
  1.1  8.14  11.76  -999. 999.
   'MULTIPOL'  septum                                                                  6
    002   .plt
   10.  10.  -5.4        0.  0.  0.  0.  0.  0.  0.  0.  0.
    0.  0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4  .1455    2.2670  -.6395  1.1558  0.  0.  0.
    0.  0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4  .1455    2.2670  -.6395  1.1558  0.  0.  0.
    0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
    #320|20|320
    2  0.00e+00  5.  0.00e+00
   'DRIFT'    dr .plt      ! distance to septum exit                                   7
    2.1011412
   'DRIFT'    dr .plt        ! distance to septum vessel opening                       8
    2.7151711
   'MULTIPOL'  QD                                                                      9
    002   .plt
   7.569871747666486  5.30e+00  0.  -2.49324632276342185  0.  0.  0.  0.  0.  0.  0.  0.
    0.  0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4  .1455    2.2670  -.6395  1.1558  0.  0.  0.
    0.  0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4  .1455    2.2670  -.6395  1.1558  0.  0.  0.
    0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
    #320|76|320
    2  0.00e+00  3.404834122312866  0.
   'MARKER'  BPM2  off                                                                 10
   'DRIFT'  sd                                                                         11
   5.00e+00
   'MULTIPOL'  QF                                                                      12
    002   .plt
```

```
     5.878241131662439  3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
      0. 0.   1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4  .1455    2.2670  -.6395  1.1558  0.  0.  0.
      0. 0.   1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4  .1455    2.2670  -.6395  1.1558  0.  0.  0.
      0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
      #320|59|320
      2  0.00e+00  0.7513707181808552  0.
     'DRIFT' ld                                                                                        13
      4.
     'MULTIPOL' kicker1                                                                                 14
      002    .plt
     13.  10.    -0.6940861941        0.  0. 0. 0. 0. 0. 0. 0. 0.
      0. 0.   1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4  .1455    2.2670  -.6395  1.1558  0.  0.  0.
      0. 0.   1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4  .1455    2.2670  -.6395  1.1558  0.  0.  0.
      0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
      #320|20|320
      2  0.00e+00  0.  0.00e+00
     'MARKER' dum  .plt                                                                                 15
     'DRIFT' ld                                                                                         16
      4.
     'MARKER' BPM1 off                                                                                  17
     'CHANGREF'                                                                                         18
      0.00e+00 0.00e+00 -8.571428571429e+00
     'MULTIPOL' QD                                                                                      19
      002    .plt
      7.569871747666486  5.30e+00  0. -2.49324632276342185  0. 0. 0. 0. 0. 0. 0. 0.
      0. 0.   1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4  .1455    2.2670  -.6395  1.1558  0.  0.  0.
      0. 0.   1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4  .1455    2.2670  -.6395  1.1558  0.  0.  0.
      0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
      #320|76|320
      2  0.00e+00  3.404834122312866 0.
     'MARKER' BPM2 off                                                                                  20
     'DRIFT' sd                                                                                         21
      5.00e+00
     'MULTIPOL' QF                                                                                      22
      002    .plt
      5.878241131662439  3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
      0. 0.   1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4  .1455    2.2670  -.6395  1.1558  0.  0.  0.
      0. 0.   1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4  .1455    2.2670  -.6395  1.1558  0.  0.  0.
      0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
      #320|59|320
      2  0.00e+00  0.7513707181808552  0.
     'DRIFT' ld                                                                                         23
      4.
     'MULTIPOL' kicker2                                                                                 24
      002    .plt
     13.  10.     6.9288734007E-03       0.  0. 0. 0. 0. 0. 0. 0. 0.
      0. 0.   1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4  .1455    2.2670  -.6395  1.1558  0.  0.  0.
      0. 0.   1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4  .1455    2.2670  -.6395  1.1558  0.  0.  0.
      0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
      #320|20|320
      2  0.00e+00  0.  0.00e+00
     'MARKER' dum  .plt                                                                                 25
     'DRIFT' ld                                                                                         26
      4.
     'MARKER' dum   .plt                                                                                27
     'CHANGREF'                                                                                         18
      0.00e+00 0.00e+00 -8.571428571429e+00
     'MULTIPOL' QD                                                                                      19
      002    .plt
      7.569871747666486  5.30e+00  0. -2.49324632276342185  0. 0. 0. 0. 0. 0. 0. 0.
      0. 0.   1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4  .1455    2.2670  -.6395  1.1558  0.  0.  0.
      0. 0.   1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4  .1455    2.2670  -.6395  1.1558  0.  0.  0.
      0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
      #320|76|320
      2  0.00e+00  3.404834122312866 0.
     'MARKER' BPM2 off                                                                                  20
     'DRIFT' sd                                                                                         21
      5.00e+00
     'MULTIPOL' QF                                                                                      22
      002    .plt
      5.878241131662439  3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
      0. 0.   1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4  .1455    2.2670  -.6395  1.1558  0.  0.  0.
      0. 0.   1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4  .1455    2.2670  -.6395  1.1558  0.  0.  0.
      0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
      #320|59|320
      2  0.00e+00  0.7513707181808552  0.
     'DRIFT' ld                                                                                         23
      21.
     'MARKER' dum   .plt                                                                                27
    'FAISCEAU'
'END'

'FIT2'                                                                                                 29
 2
14 4 0.    [-.9 ,.9]      kicker 1
24 4 0.    [ -.7, .7]     kicker 2
 2
3 1 2 35  3.100903E-01  1. 0.    position at entrance of Cell (before 2pi/42 angle)
3 1 3 35 -1.068780E+01  1. 0.    angle   at entrance of Cell (before 2pi/42 angle)
'END'                                                                                                  30
```

16 MeV

```
Data generated by searchCO
'OBJET'                                                                          1
5.171103865922e+01
2
 1  1
 9.95 -1.134464013796314225e3 0. 0. 0.  1.06453830E+00 'i'        16.000000 MeV
  1 1 1 1 1 1 1 1 1 1
    'PARTICUL'                                                                   2
     5.10998920e-01 1.602176487e-19 1.159652181100e-03 0.00e+00 0
    'FAISTORE'                                                                   3
     b_zgoubi.fai
        1
  'COLLIMA'                                                                      5
   1
  1.1  8.14  11.76 -999. 999.
    'MULTIPOL' septum                                                           6
     002      .plt
   10.  10.  -4.6        0.  0. 0. 0. 0. 0. 0. 0. 0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
    #320|20|320
    2  0.00e+00  5.  0.00e+00
    'DRIFT'    dr   .plt      ! distance to septum exit                          7
    2.1011412
    'DRIFT'    dr   .plt      ! distance to septum vessel opening                8
    2.7151711
    'MULTIPOL' QD                                                               9
     002      .plt
    7.569871747666486  5.30e+00  0. -2.49324632276342185  0. 0. 0. 0. 0. 0. 0. 0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
    #320|76|320
    2  0.00e+00  3.404834122312866 0.
    'MARKER' BPM2 off                                                           10
    'DRIFT' sd                                                                  11
    5.00e+00
    'MULTIPOL' QF                                                               12
     002      .plt
    5.878241131662439  3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
    #320|59|320
    2  0.00e+00  0.7513707181808552  0.
    'DRIFT' ld                                                                  13
    4.
    'MULTIPOL' kicker1                                                          14
     002      .plt
   13.  10.   -0.789811378       0.  0. 0. 0. 0. 0. 0. 0. 0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
    #320|20|320
    2  0.00e+00  0.  0.00e+00
    'MARKER' dum    .plt                                                        15
    'DRIFT' ld                                                                  16
    4.
    'MARKER' BPM1 off                                                           17
    'CHANGREF'                                                                  18
    0.00e+00 0.00e+00 -8.571428571429e+00
    'MULTIPOL' QD                                                               19
     002      .plt
    7.569871747666486  5.30e+00  0. -2.49324632276342185  0. 0. 0. 0. 0. 0. 0. 0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
    #320|76|320
    2  0.00e+00  3.404834122312866 0.
    'MARKER' BPM2 off                                                           20
    'DRIFT' sd                                                                  21
    5.00e+00
    'MULTIPOL' QF                                                               22
     002      .plt
    5.878241131662439  3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
    #320|59|320
    2  0.00e+00  0.7513707181808552  0.
    'DRIFT' ld                                                                  23
    4.
    'MULTIPOL' kicker2                                                          24
     002      .plt
   13.  10.   0.155328657     0.  0. 0. 0. 0. 0. 0. 0. 0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
```

```
       0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
      #320|20|320
      2  0.00e+00  0.  0.00e+00
      'MARKER' dum    .plt                                                                    25
      'DRIFT' ld                                                                              26
      4.
      'MARKER' dum      .plt                                                                  27
      'CHANGREF'                                                                              18
      0.00e+00 0.00e+00 -8.571428571429e+00
      'MULTIPOL' QD                                                                           19
      002    .plt
      7.569871747666486  5.30e+00  0. -2.49324632276342185  0. 0. 0. 0. 0. 0. 0. 0.
       0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
       4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
       0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
       4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
       0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
      #320|76|320
      2  0.00e+00  3.404834122312866 0.
      'MARKER' BPM2 off                                                                       20
      'DRIFT' sd                                                                              21
      5.00e+00
      'MULTIPOL' QF                                                                           22
      002    .plt
      5.878241131662439  3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
       0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
       4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
       0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
       4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
       0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
      #320|59|320
      2  0.00e+00  0.7513707181808552  0.
      'DRIFT' ld                                                                              23
      21.
      'MARKER' dum      .plt                                                                  27
      'FAISCEAU'
     'END'                                                                                    30

     'FIT2'                                                                                   29
      2
     14 4 0.    [-.9 ,.9]        kicker 1
     24 4 0.    [ -.7, .7]       kicker 2
      2
     3 1 2 35   3.258774E-02  1. 0.    position at entrance of Cell (before 2pi/42 angle)
     3 1 3 35   7.189738E-01  1. 0.    angle    at entrance of Cell (before 2pi/42 angle)
     'END'                                                                                    30
```

15 MeV

```
Data generated by searchCO
'OBJET'                                                                                       1
5.171103865922e+01
2
 1  1
 9.95  -1134.46E+00  0.0E+00  0.0E+00  0.0E+00  1.00000000E+00 'i'        15.000000 MeV
 1 1 1 1 1 1 1 1 1 1 1
   'PARTICUL'                                                                                 2
   5.10998920e-01 1.602176487e-19 1.159652181100e-03 0.00e+00 0
   'FAISTORE'                                                                                 3
   b_zgoubi.fai
     1
   'FAISCEAU'  ! theor. beam position/angle *Check* : ~-9cm/65deg. (1134.4640mrad)           4
  'COLLIMA'                                                                                   5
   1
  1.1  8.14  11.76 -999. 999.
   'MULTIPOL' septum                                                                          6
   002   .plt
  10.  10.  -4.7  0.  0. 0. 0. 0. 0. 0. 0. 0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
  #320|20|320
  2  0.00e+00  5.  0.00e+00
   'DRIFT'    dr .plt     ! distance to septum exit                                           7
  2.1011412
   'DRIFT'    dr .plt       ! distance to septum vessel opening                               8
  2.7151711
   'MULTIPOL' QD                                                                              9
   002   .plt
  7.569871747666486  5.30e+00  0. -2.49324632276342185  0. 0. 0. 0. 0. 0. 0. 0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
  #320|76|320
  2  0.00e+00  3.404834122312866 0.
   'MARKER' BPM2 off                                                                          10
   'DRIFT' sd                                                                                 11
  5.00e+00
   'MULTIPOL' QF                                                                              12
   002   .plt
  5.878241131662439  3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
  #320|59|320
  2  0.00e+00  0.7513707181808552  0.
   'DRIFT' ld                                                                                 13
```

```
      4.
      'MULTIPOL' kicker1                                                                        14
       002    .plt
      13.  10.  -0.6342251672  0.  0.  0.  0.  0.  0.  0.  0.  0.
       0.  0.   1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
       4  .1455    2.2670  -.6395  1.1558  0. 0.  0.
       0.  0.   1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
       4  .1455    2.2670  -.6395  1.1558  0. 0.  0.
       0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
      #320|20|320
      2 0.00e+00  0.  0.00e+00
      'MARKER' dum  .plt                                                                        15
      'DRIFT' ld                                                                                16
      4.
      'MARKER' BPM1 off                                                                         17
      'CHANGREF'                                                                                18
      0.00e+00 0.00e+00 -8.571428571429e+00
      'MULTIPOL' QD                                                                             19
       002    .plt
      7.569871747666486  5.30e+00  0. -2.49324632276342185  0. 0. 0. 0. 0. 0. 0. 0.
       0.  0.   1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
       4  .1455    2.2670  -.6395  1.1558  0. 0.  0.
       0.  0.   1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
       4  .1455    2.2670  -.6395  1.1558  0. 0.  0.
       0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
      #320|76|320
      2 0.00e+00  3.404834122312866 0.
      'MARKER' BPM2 off                                                                         20
      'DRIFT' sd                                                                                21
      5.00e+00
      'MULTIPOL' QF                                                                             22
       002    .plt
      5.878241131662439  3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
       0.  0.   1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
       4  .1455    2.2670  -.6395  1.1558  0. 0.  0.
       0.  0.   1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
       4  .1455    2.2670  -.6395  1.1558  0. 0.  0.
       0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
      #320|59|320
      2 0.00e+00  0.7513707181808552  0.
      'DRIFT' ld                                                                                23
      4.
      'MULTIPOL' kicker2                                                                        24
       002    .plt
      13.  10.  -0.1656477872  0.  0.  0.  0.  0.  0.  0.  0.  0.
       0.  0.   1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
       4  .1455    2.2670  -.6395  1.1558  0. 0.  0.
       0.  0.   1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
       4  .1455    2.2670  -.6395  1.1558  0. 0.  0.
       0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
      #320|20|320
      2 0.00e+00  0.  0.00e+00
      'MARKER' dum  .plt                                                                        25
      'DRIFT' ld                                                                                26
      4.
      'MARKER' dum   .plt                                                                       27
      'MARKER' BPM1 off                                                                         17
      'CHANGREF'                                                                                18
      0.00e+00 0.00e+00 -8.571428571429e+00
      'MULTIPOL' QD                                                                             19
       002    .plt
      7.569871747666486  5.30e+00  0. -2.49324632276342185  0. 0. 0. 0. 0. 0. 0. 0.
       0.  0.   1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
       4  .1455    2.2670  -.6395  1.1558  0. 0.  0.
       0.  0.   1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
       4  .1455    2.2670  -.6395  1.1558  0. 0.  0.
       0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
      #320|76|320
      2 0.00e+00  3.404834122312866 0.
      'MARKER' BPM2 off                                                                         20
      'DRIFT' sd                                                                                21
      5.00e+00
      'MULTIPOL' QF                                                                             22
       002    .plt
      5.878241131662439  3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
       0.  0.   1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
       4  .1455    2.2670  -.6395  1.1558  0. 0.  0.
       0.  0.   1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
       4  .1455    2.2670  -.6395  1.1558  0. 0.  0.
       0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
      #320|59|320
      2 0.00e+00  0.7513707181808552  0.
      'DRIFT' ld                                                                                23
      21.
      'MARKER' dum   .plt                                                                       27
      'FAISCEAU'
'END'
                                                                               28
      'FIT2'                                                                                    29
       2
      14 4 0.  [-.7 ,.7]       kicker 1
      24 4 0.  [ -.7, .7]      kicker 2
       2
      3 1 2 28 -6.239026E-02  1. 0.     position at entrance of Cell (before 2pi/42 angle)
      3 1 3 28  6.622761E+00  1. 0.     angle    at entrance of Cell (before 2pi/42 angle)
      'END'                                                                                     30
```

14 MeV

```
Data generated by searchCO
'OBJET'                                                                                        1
5.171103865922e+01
2
```

```
 1  1
9.95 -1.134464013796314225e3 0. 0. 0.  9.35457160E-01 'i'        14.000000 MeV
 1 1 1 1 1 1 1 1 1 1 1
   'PARTICUL'                                                                          2
   5.10998920e-01 1.602176487e-19 1.159652181100e-03 0.00e+00 0
   'FAISTORE'                                                                          3
   b_zgoubi.fai
       1
 'COLLIMA'                                                                             5
  1
 1.1  8.14  11.76 -999. 999.
   'MULTIPOL' septum                                                                   6
   002     .plt
  10.  10. -4.2       0.  0. 0. 0. 0. 0. 0. 0. 0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
   #320|20|320
   2  0.00e+00  5.  0.00e+00
   'DRIFT'    dr   .plt       ! distance to septum exit                               7
   2.1011412
   'DRIFT'    dr   .plt       ! distance to septum vessel opening                     8
   2.7151711
   'MULTIPOL' QD                                                                       9
   002     .plt
   7.569871747666486  5.30e+00  0. -2.49324632276342185  0. 0. 0. 0. 0. 0. 0. 0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
   #320|76|320
   2  0.00e+00  3.404834122312866 0.
   'MARKER' BPM2 off                                                                  10
   'DRIFT' sd                                                                         11
   5.00e+00
   'MULTIPOL' QF                                                                      12
    002     .plt
   5.878241131662439  3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
   #320|59|320
   2  0.00e+00  0.7513707181808552 0.
   'DRIFT' ld                                                                         13
   4.
   'MULTIPOL' kicker1                                                                 14
   002     .plt
  13.  10.    -0.7047705196       0.  0. 0. 0. 0. 0. 0. 0. 0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
   #320|20|320
   2  0.00e+00  0.  0.00e+00
   'MARKER' dum    .plt                                                               15
   'DRIFT' ld                                                                         16
   4.
   'MARKER' BPM1 off                                                                  17
   'CHANGREF'                                                                         18
   0.00e+00 0.00e+00 -8.571428571429e+00
   'MULTIPOL' QD                                                                      19
   002     .plt
   7.569871747666486  5.30e+00  0. -2.49324632276342185  0. 0. 0. 0. 0. 0. 0. 0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
   #320|76|320
   2  0.00e+00  3.404834122312866 0.
   'MARKER' BPM2 off                                                                  20
   'DRIFT' sd                                                                         21
   5.00e+00
   'MULTIPOL' QF                                                                      22
    002     .plt
   5.878241131662439  3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
   #320|59|320
   2  0.00e+00  0.7513707181808552 0.
   'DRIFT' ld                                                                         23
   4.
   'MULTIPOL' kicker2                                                                 24
   002     .plt
  13.  10.    1.5027153436E-03     0.  0. 0. 0. 0. 0. 0. 0. 0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
   #320|20|320
   2  0.00e+00  0.  0.00e+00
   'MARKER' dum    .plt                                                               25
   'DRIFT' ld                                                                         26
   4.
```

```
      'MARKER' dum    .plt                                                              27
      'CHANGREF'                                                                        18
      0.00e+00 0.00e+00 -8.571428571429e+00
      'MULTIPOL' QD                                                                     19
       002    .plt
      7.569871747666486  5.30e+00  0. -2.49324632276342185  0. 0. 0. 0. 0. 0. 0. 0.
       0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
       4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
       0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
       4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
       0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
      #320|76|320
       2  0.00e+00  3.404834122312866 0.
      'MARKER' BPM2 off                                                                 20
      'DRIFT' sd                                                                        21
      5.00e+00
      'MULTIPOL' QF                                                                     22
       002    .plt
      5.878241131662439  3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
       0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
       4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
       0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
       4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
       0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
      #320|59|320
       2  0.00e+00  0.7513707181808552 0.
      'DRIFT' ld                                                                        23
      21.
      'MARKER' dum    .plt                                                              27
      'FAISCEAU'
   'END'

   'FIT2'                                                                               29
    2
   14 4 0.    [-.9 ,.9]      kicker 1
   24 4 0.    [ -.7, .7]     kicker 2
    2
   3 1 2 35  -1.267439E-01  1. 0.     position at entrance of Cell (before 2pi/42 angle)
   3 1 3 35   1.266171E+01  1. 0.     angle    at entrance of Cell (before 2pi/42 angle)
   'END'                                                                                30
```

12 MeV

```
Data generated by searchCO
'OBJET'                                                                                 1
5.171103865922e+01
2
 1  1
 9.95 -1.134464013796314225e3 0. 0. 0.  8.06353490E-01 'i'        12.000000 MeV
  1 1 1 1 1 1 1 1 1 1 1
     'PARTICUL'                                                                         2
     5.10998920e-01 1.602176487e-19 1.159652181100e-03 0.00e+00 0
     'FAISCEAU'                                                                         3
     'FAISCEAU'                                                                         3
   'COLLIMA'                                                                            4
    1
   1.1  8.14  11.76 -999. 999.
     'MULTIPOL' septum                                                                  5
      002    .plt
    10.  10. -2.8  0.  0. 0. 0. 0. 0. 0. 0. 0.
     0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
     4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
     0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
     4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
     0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
    #320|20|320
     2  0.00e+00  5.  0.00e+00
     'DRIFT'   dr  .plt     ! distance to septum exit                                   6
    2.1011412
     'DRIFT'   dr  .plt        ! distance to septum vessel opening                      7
    2.7151711
     'MULTIPOL' QD                                                                      8
      002    .plt
    7.569871747666486  5.30e+00  0. -2.49324632276342185  0. 0. 0. 0. 0. 0. 0. 0.
     0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
     4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
     0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
     4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
     0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
    #320|76|320
     2  0.00e+00  3.404834122312866 0.
     'MARKER' BPM2 off                                                                  9
     'DRIFT' sd                                                                         10
    5.00e+00
     'MULTIPOL' QF                                                                      11
      002    .plt
    5.878241131662439  3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
     0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
     4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
     0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
     4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
     0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
    #320|59|320
     2  0.00e+00  0.7513707181808552 0.
     'DRIFT' ld                                                                         12
    4.
     'MULTIPOL' kicker1                                                                 13
      002    .plt
    13.  10.    -0.1424546679     0. 0. 0. 0. 0. 0. 0. 0. 0.
     0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
     4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
     0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
     4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
```

```
        0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
        #320|20|320
        2  0.00e+00  0.  0.00e+00
        'MARKER' dum     .plt                                                                14
        'DRIFT' ld                                                                           15
        4.
        'MARKER' BPM1 off                                                                    16
        'CHANGREF'                                                                           17
        0.00e+00 0.00e+00 -8.571428571429e+00
        'MULTIPOL' QD                                                                        18
        002     .plt
        7.569871747666486  5.30e+00  0. -2.49324632276342185  0. 0. 0. 0. 0. 0. 0. 0.
         0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
         4  .1455    2.2670  -.6395  1.1558  0. 0.  0.
         0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
         4  .1455    2.2670  -.6395  1.1558  0. 0.  0.
         0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
        #320|76|320
        2  0.00e+00  3.404834122312866 0.
        'MARKER' BPM2 off                                                                    19
        'DRIFT' sd                                                                           20
        5.00e+00
        'MULTIPOL' QF                                                                        21
         002     .plt
        5.878241131662439  3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
         0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
         4  .1455    2.2670  -.6395  1.1558  0. 0.  0.
         0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
         4  .1455    2.2670  -.6395  1.1558  0. 0.  0.
         0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
        #320|59|320
        2  0.00e+00  0.7513707181808552  0.
        'DRIFT' ld                                                                           22
        4.
        'MULTIPOL' kicker2                                                                   23
        002     .plt
       13.  10.     0.695318002       0.  0. 0. 0. 0. 0. 0. 0. 0.
         0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
         4  .1455    2.2670  -.6395  1.1558  0. 0.  0.
         0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
         4  .1455    2.2670  -.6395  1.1558  0. 0.  0.
         0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
        #320|20|320
        2  0.00e+00  0.  0.00e+00
        'MARKER' dum     .plt                                                                24
        'DRIFT' ld                                                                           25
        4.
        'MARKER' dum     .plt                                                                26
        'CHANGREF'                                                                           27
        0.00e+00 0.00e+00 -8.571428571429e+00
        'MULTIPOL' QD                                                                        28
        002     .plt
        7.569871747666486  5.30e+00  0. -2.49324632276342185  0. 0. 0. 0. 0. 0. 0. 0.
         0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
         4  .1455    2.2670  -.6395  1.1558  0. 0.  0.
         0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
         4  .1455    2.2670  -.6395  1.1558  0. 0.  0.
         0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
        #320|76|320
        2  0.00e+00  3.404834122312866 0.
        'MARKER' BPM2 off                                                                    29
        'DRIFT' sd                                                                           30
        5.00e+00
        'MULTIPOL' QF                                                                        31
         002     .plt
        5.878241131662439  3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
         0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
         4  .1455    2.2670  -.6395  1.1558  0. 0.  0.
         0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
         4  .1455    2.2670  -.6395  1.1558  0. 0.  0.
         0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
        #320|59|320
        2  0.00e+00  0.7513707181808552  0.
        'DRIFT' ld                                                                           32
        21.
        'MARKER' dum     .plt                                                                33
        'FAISCEAU'                                                                           34
'END'

  'FIT2'                                                                                      36
   2
  14 4 0.    [-.9 ,.9]      kicker 1
  24 4 0.    [ -.9, .9]     kicker 2
   2
  3 1 2 35 -1.591154E-01  1. 0.    position at entrance of Cell (before 2pi/42 angle)
  3 1 3 35  2.514833E+01  1. 0.    angle   at entrance of Cell (before 2pi/42 angle)
  'END'                                                                                       37
```

10 MeV

```
Data generated by searchCO
'OBJET'                                                                                       1
5.171103865922e+01
2
 1  1
 0. 0. 0. 0. 0.  6.77214420E-01 'i'       10.000000 MeV
  1 1 1 1 1 1 1 1 1 1
    'PARTICUL'                                                                                2
    5.10998920e-01 1.602176487e-19 1.159652181100e-03 0.00e+00 0
    'FAISTORE'                                                                                3
    b_zgoubi.fai
     1
  'CHANGREF'   ! theor. beam position/angle *Check* : ~-9cm/65deg. (1134.4640mrad)            4
```

```
 ZR 65.   YS -9.95
'COLLIMA'                                                                                          5
 1
1.1  8.14  11.76 -999. 999.
  'MULTIPOL' septum                                                                                6
  00  2   ! .plt
 10.  10. -2.4  0.  0. 0. 0. 0. 0. 0. 0. 0.
  0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
  4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
  0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
  4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
  0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
  #320|20|320
  2  0.00e+00  5.  0.00e+00
  'DRIFT'    dr !  .plt      ! distance to septum exit                                             7
  2.1011412
  'DRIFT'    dr !  .plt       ! distance to septum vessel opening                                  8
  2.7151711
  'MULTIPOL' QD                                                                                    9
  00  2  ! .plt
  7.569871747666486  5.30e+00  0. -2.49324632276342185  0. 0. 0. 0. 0. 0. 0. 0.
  0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
  4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
  0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
  4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
  0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
  #320|76|320
  2  0.00e+00  3.404834122312866 0.
  'MARKER' BPM2 off                                                                                10
  'DRIFT' sd                                                                                       11
  5.00e+00
  'MULTIPOL' QF                                                                                    12
  00  2   ! .plt
  5.878241131662439  3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
  0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
  4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
  0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
  4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
  0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
  #320|59|320
  2  0.00e+00  0.7513707181808552  0.
  'DRIFT' ld                                                                                       13
  4.
  'MULTIPOL' kicker1                                                                               14
  00  2   ! .plt
 13.  10.  .3856279358  0.  0. 0. 0. 0. 0. 0. 0. 0.
  0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
  4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
  0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
  4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
  0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
  #320|20|320
  2  0.00e+00  0.  0.00e+00
  'MARKER' dum  !  .plt                                                                            15
  'DRIFT' ld                                                                                       16
  4.
  'MARKER' BPM1 off                                                                                17
  'CHANGREF'                                                                                       18
  0.00e+00 0.00e+00 -8.571428571429e+00
  'MULTIPOL' QD                                                                                    19
  00  2   ! .plt
  7.569871747666486  5.30e+00  0. -2.49324632276342185  0. 0. 0. 0. 0. 0. 0. 0.
  0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
  4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
  0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
  4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
  0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
  #320|76|320
  2  0.00e+00  3.404834122312866 0.
  'MARKER' BPM2 off                                                                                20
  'DRIFT' sd                                                                                       21
  5.00e+00
  'MULTIPOL' QF                                                                                    22
  00  2   ! .plt
  5.878241131662439  3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
  0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
  4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
  0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
  4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
  0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
  #320|59|320
  2  0.00e+00  0.7513707181808552  0.
  'DRIFT' ld                                                                                       23
  4.
  'MULTIPOL' kicker2                                                                               24
  00  2   ! .plt
 13.  10.  .5392169561  0.  0. 0. 0. 0. 0. 0. 0. 0.
  0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
  4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
  0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
  4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
  0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
  #320|20|320
  2  0.00e+00  0.  0.00e+00
  'MARKER' dum  !  .plt                                                                            25
  'DRIFT' ld                                                                                       26
  4.
  'MARKER' dum   !  .plt                                                                           27
  'CHANGREF'                                                                                       18
  0.00e+00 0.00e+00 -8.571428571429e+00
  'MULTIPOL' QD                                                                                    19
  00  2   ! .plt
  7.569871747666486  5.30e+00  0. -2.49324632276342185  0. 0. 0. 0. 0. 0. 0. 0.
  0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
```

```
 4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
  0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
 4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
  0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
 #320|76|320
 2  0.00e+00  3.404834122312866 0.
 'MARKER' BPM2 off                                                            20
 'DRIFT' sd                                                                   21
 5.00e+00
 'MULTIPOL' QF                                                                22
   00  2  !  .plt
 5.878241131662439  3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
  0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
 4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
  0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
 4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
  0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
 #320|59|320
 2  0.00e+00  0.7513707181808552 0.
 'DRIFT' ld                                                                   23
 21.
 'MARKER' dum   !  .plt                                                       27
  'FAISCEAU'
 'FIT2'                                                                       29
  2
 14 4 0.    [-.7 ,.7]       kicker 1
 24 4 0.    [ -.7, .7]      kicker 2
  2
 3 1 2 35 -5.547658E-02  1. 0.    position at entrance of Cell (before 2pi/42 angle)
 3 1 3 35  3.818484E+01  1. 0.    angle    at entrance of Cell (before 2pi/42 angle)
 'END'                                                                        30
```

B Closed orbit coordinates right upstream of corner angle

x (cm)	x' (mrad)				p/p_15MeV	
-5.547658E-02	3.818484E+01	0.0E+00	0.0E+00	0.0E+00	6.77214420E-01	10.MeV
-1.248694E-01	3.159750E+01	0.0E+00	0.0E+00	0.0E+00	7.41789530E-01	11.MeV
-1.591154E-01	2.514833E+01	0.0E+00	0.0E+00	0.0E+00	8.06353490E-01	12.MeV
-1.593567E-01	1.883640E+01	0.0E+00	0.0E+00	0.0E+00	8.70908760E-01	13.MeV
-1.267439E-01	1.266171E+01	0.0E+00	0.0E+00	0.0E+00	9.35457160E-01	14.MeV
-6.239062E-02	6.622768E+00	0.0E+00	0.0E+00	0.0E+00	1.00000000E+00	15.MeV
3.258774E-02	7.189738E-01	0.0E+00	0.0E+00	0.0E+00	1.06453830E+00	16.MeV
1.571024E-01	-5.050793E+00	0.0E+00	0.0E+00	0.0E+00	1.12907280E+00	17.MeV
3.100903E-01	-1.068780E+01	0.0E+00	0.0E+00	0.0E+00	1.19360420E+00	18.MeV
4.905088E-01	-1.619359E+01	0.0E+00	0.0E+00	0.0E+00	1.25813300E+00	19.MeV
6.973489E-01	-2.156972E+01	0.0E+00	0.0E+00	0.0E+00	1.32265940E+00	20.MeV

C Coordinates of the 7×3 injection orbits in Figs. 4-10

Left and right columns below are respectively the Z_Lab and X_Lab coordinates in Figs. 4-10.

20 MeV, B_{Sep}=-6.6 kG

```
3.061515884556E-18   9.950000000000E-02
1.318312170000E-02   7.832973801615E-02
3.104224760000E-02   6.092208706985E-02
5.254304950000E-02   4.828522786662E-02
7.644028780000E-02   4.115103615847E-02
1.000000000000E-01   3.984452469175E-02
1.521401225100E-01   4.291319421877E-02
1.571105359100E-01   4.322488581369E-02
1.620799447000E-01   4.355220139527E-02
1.670482614000E-01   4.389569483801E-02
1.720153908000E-01   4.425594700602E-02
1.769812299000E-01   4.463356666295E-02
1.819456668000E-01   4.502919141894E-02
1.869085800000E-01   4.544348871469E-02
1.918698379000E-01   4.587715684277E-02
1.968292975000E-01   4.633092600605E-02
2.017868035000E-01   4.680555941322E-02
2.067421875000E-01   4.730185441079E-02
2.116952668000E-01   4.782064365099E-02
2.166458429000E-01   4.836279629470E-02
2.215937004000E-01   4.892921924808E-02
2.748513945787E-01   5.528418883408E-02
2.798066889867E-01   5.579395890394E-02
2.847726061767E-01   5.618696469625E-02
2.897464483767E-01   5.646203571432E-02
2.947254368767E-01   5.661834952878E-02
2.997067399767E-01   5.665543760675E-02
3.046875021767E-01   5.657318865620E-02
3.096648735767E-01   5.637184942274E-02
3.146360391767E-01   5.605202292424E-02
3.195982474767E-01   5.561466415597E-02
3.245488388767E-01   5.506107334671E-02
3.294852720767E-01   5.439288689029E-02
3.726442517933E-01   4.742409360161E-02
4.047522246933E-01   4.239232746300E-02
4.369105032933E-01   3.769278465306E-02
4.691156503933E-01   3.332596751243E-02
5.013642237933E-01   2.929234281623E-02
5.482292467876E-01   2.369429663012E-02
5.531724877494E-01   2.308888215338E-02
5.581137006604E-01   2.246713204831E-02
5.630528582132E-01   2.182925892243E-02
5.679899312562E-01   2.117544785142E-02
5.729248889652E-01   2.050585664191E-02
5.778576979789E-01   1.982061620674E-02
5.827883227261E-01   1.911983071754E-02
5.877167243609E-01   1.840357792366E-02
5.926428608785E-01   1.767190925019E-02
5.975666869286E-01   1.692484989863E-02
6.024881531270E-01   1.616239898007E-02
6.074072057575E-01   1.538452954684E-02
6.123237869610E-01   1.459118850756E-02
6.172378335344E-01   1.378229670898E-02
6.211758952449E-01   1.312244841476E-02
6.744130136124E-01   4.119163173442E-03
6.793162282795E-01   3.239219564551E-03
6.842124038480E-01   2.320915845414E-03
6.891013235203E-01   1.364733249065E-03
6.939827992503E-01   3.712451297750E-04
6.988566745680E-01  -6.588850920472E-04
7.037228261787E-01  -1.724906069032E-03
7.085811666123E-01  -2.825981080879E-03
7.134316452537E-01  -3.961190587547E-03
7.182742499338E-01  -5.129535095127E-03
7.231090081921E-01  -6.329938185097E-03
7.279359879169E-01  -7.561249646440E-03
7.859072245928E-01  -2.242856221405E-02
8.175465275514E-01  -2.985606477891E-02
8.493309172208E-01  -3.663587716456E-02
8.812471359055E-01  -4.276517143412E-02
9.337587022013E-01  -5.189867797749E-02
9.387146974433E-01  -5.277025088432E-02
9.436116888074E-01  -5.367661140164E-02
9.485004307550E-01  -5.462646566938E-02
9.533807183111E-01  -5.561884698226E-02
9.582523551846E-01  -5.665286202415E-02
9.631155510578E-01  -5.772768930781E-02
9.679689193166E-01  -5.884257778093E-02
9.728134742725E-01  -5.999684531396E-02
9.776486292325E-01  -6.118987749436E-02
9.824741943633E-01  -6.242112640856E-02
9.872899744439E-01  -6.369010944553E-02
9.920957668881E-01  -6.499640824362E-02
9.968913599406E-01  -6.633966775751E-02
1.001676530758E+00  -6.771959533824E-02
1.006451043568E+00  -6.913595995045E-02
1.057337159005E+00  -8.462467062281E-02
1.062100496528E+00  -8.608293956137E-02
1.066860590692E+00  -8.755176094815E-02
```

```
1.071617418482E+00  -8.903112640198E-02
1.076370964898E+00  -9.052100190404E-02
1.081121223279E+00  -9.202132796959E-02
1.085868195295E+00  -9.353201978962E-02
1.090611891278E+00  -9.505296754170E-02
1.095352330135E+00  -9.658403664528E-02
1.100089539829E+00  -9.812506825577E-02
1.104823556974E+00  -9.967587955400E-02
1.109554427271E+00  -1.012362643609E-01
1.311730279888E+00  -1.684059203615E-01
```

20 MeV, B_{Sep}=-6.35 kG

```
3.061515884556E-18   9.950000000000E-02
1.308861900000E-02   7.826589550738E-02
3.071064790000E-02   6.061190910556E-02
5.192100290000E-02   4.748483860533E-02
7.558215520000E-02   3.958869959437E-02
1.000000000000E-01   3.733672681776E-02
1.521462382400E-01   3.849235344115E-02
1.571249721700E-01   3.861228760006E-02
1.621035125000E-01   3.874000596822E-02
1.670818410000E-01   3.887572605526E-02
1.720599383000E-01   3.901967896849E-02
1.770377832000E-01   3.917210079999E-02
1.820153527000E-01   3.933327803661E-02
1.869926223000E-01   3.950345799344E-02
1.919695651000E-01   3.968293927134E-02
1.969461522000E-01   3.987202723918E-02
2.019223500000E-01   4.007104554135E-02
2.068981305000E-01   4.028032663134E-02
2.118734509000E-01   4.050023233189E-02
2.168482729000E-01   4.073113442259E-02
2.218225532000E-01   4.097342525543E-02
2.748569532227E-01   4.366831388848E-02
2.798347635867E-01   4.385988726600E-02
2.848151863767E-01   4.396323251108E-02
2.897966588767E-01   4.397806622747E-02
2.947776081767E-01   4.390434771531E-02
2.997564662767E-01   4.374227918476E-02
3.047316863767E-01   4.349230469558E-02
3.097017577767E-01   4.315510783837E-02
3.146652216767E-01   4.273160819249E-02
3.196206847767E-01   4.222295661308E-02
3.245668337767E-01   4.163052941673E-02
3.295024478767E-01   4.095592155003E-02
3.726442517933E-01   3.425896378542E-02
4.048052286933E-01   2.958062088420E-02
4.370527205933E-01   2.554148874099E-02
4.693740243933E-01   2.214315849243E-02
5.017564077933E-01   1.938696884389E-02
5.470657051187E-01   1.600518857229E-02
5.520300098822E-01   1.560796622300E-02
5.569918858620E-01   1.518147220275E-02
5.619512099478E-01   1.472626128550E-02
5.669078638966E-01   1.424283948594E-02
5.718617328077E-01   1.373166494802E-02
5.768127042825E-01   1.319314867323E-02
5.817606762184E-01   1.262765524517E-02
5.867055107924E-01   1.203550346596E-02
5.916471233374E-01   1.141696694844E-02
5.965853918013E-01   1.077227455901E-02
6.015202002097E-01   1.010161094910E-02
6.064514293050E-01   9.405116846966E-03
6.113789551881E-01   8.682889437341E-03
6.163026489389E-01   7.934982530628E-03
6.202995852815E-01   7.308511688112E-03
6.736160840660E-01  -1.172598097276E-03
6.785304124025E-01  -1.988234250475E-03
6.834403893641E-01  -2.829668882263E-03
6.883459220086E-01  -3.696630973934E-03
6.932469322892E-01  -4.588819918118E-03
6.981433587203E-01  -5.505825611332E-03
7.030351566241E-01  -6.447210499540E-03
7.079222997382E-01  -7.412470491119E-03
7.128047805143E-01  -8.401044429751E-03
7.176826108891E-01  -9.412315689913E-03
7.225558231323E-01  -1.044561392924E-02
7.274244694880E-01  -1.150021679751E-02
7.856966353574E-01  -2.418932673471E-02
8.175270384427E-01  -3.075169616485E-02
8.494281337760E-01  -3.696131218791E-02
8.813960124097E-01  -4.281741381800E-02
9.337587022009E-01  -5.189867797964E-02
9.387146974427E-01  -5.277025088640E-02
9.436116880067E-01  -5.367661140372E-02
9.485004307543E-01  -5.462646567146E-02
9.533807183105E-01  -5.561884698434E-02
9.582523551840E-01  -5.665286202624E-02
9.631151510572E-01  -5.772768930991E-02
9.679689193159E-01  -5.884257778305E-02
9.728134742718E-01  -5.999684531609E-02
9.776486292319E-01  -6.118987749651E-02
9.824741943627E-01  -6.242112641074E-02
9.872899744432E-01  -6.369010944774E-02
9.920957668874E-01  -6.499640824586E-02
9.968913599399E-01  -6.633966775679E-02
1.001676530760E+00  -6.771959534057E-02
1.006451043567E+00  -6.913595995282E-02
1.057337159004E+00  -8.462467062569E-02
1.062100496521E+00  -8.608293956430E-02
1.066860590691E+00  -8.755176095112E-02
1.071617418481E+00  -8.903112640497E-02
```

```
1.076370964897E+00 -9.052100190705E-02
1.081121223278E+00 -9.202132797262E-02
1.085868195294E+00 -9.353201979266E-02
1.090611891277E+00 -9.505296754473E-02
1.095352330134E+00 -9.658403664831E-02
1.100089539828E+00 -9.812506825879E-02
1.104823556973E+00 -9.967587955700E-02
1.109554427270E+00 -1.012362643639E-01
1.311730279887E+00 -1.684059203628E-01
```

20 MeV, B_{Sep}=-6.1 kG

```
3.061515884556E-18  9.950000000000E-02
1.299371770000E-02  7.820262262483E-02
3.037513090000E-02  6.030565474013E-02
5.128371680000E-02  4.669514331332E-02
7.468432850000E-02  3.804492049590E-02
9.941844350000E-02  3.478324339513E-02
1.511509187000E-01  3.403454797384E-02
1.561305777300E-01  3.396259939531E-02
1.611102346000E-01  3.389050452419E-02
1.660898877000E-01  3.381814037099E-02
1.710695349000E-01  3.374538348714E-02
1.760491747000E-01  3.367210975451E-02
1.810288049000E-01  3.359819417385E-02
1.860084236000E-01  3.352351065168E-02
1.909880289000E-01  3.344793178537E-02
1.959676185000E-01  3.337132864596E-02
2.009471902000E-01  3.329357055844E-02
2.059267416000E-01  3.321452487904E-02
2.109062702000E-01  3.313405676921E-02
2.158857734000E-01  3.305202896583E-02
2.208652483000E-01  3.296830154743E-02
2.738618404767E-01  3.205591207664E-02
2.788420310167E-01  3.194036921358E-02
2.838204929067E-01  3.176553049471E-02
2.887965402767E-01  3.153184483037E-02
2.937695109767E-01  3.123991140105E-02
2.987387730767E-01  3.089047742642E-02
3.037037310767E-01  3.048443541099E-02
3.086638318767E-01  3.002281989416E-02
3.136185696767E-01  2.950680373713E-02
3.185674912767E-01  2.893769398269E-02
3.235102002767E-01  2.831692732693E-02
3.284463607767E-01  2.764606524416E-02
3.326442517767E-01  2.703657586399E-02
3.984020567933E-01  1.752554191864E-02
4.307052709933E-01  1.396532911820E-02
4.630997587933E-01  1.136342035548E-02
4.955570977933E-01  9.722098524271E-03
5.448885731571E-01  8.254875805066E-03
5.498656252038E-01  8.078867742786E-03
5.548409892499E-01  7.860268613878E-03
5.598143475745E-01  7.599989568363E-03
5.647854010202E-01  7.298872877201E-03
5.697538660649E-01  6.957693115959E-03
5.747194724045E-01  6.577158238197E-03
5.796819605795E-01  6.157910602187E-03
5.846410795950E-01  5.700527952597E-03
5.895965850268E-01  5.205524277656E-03
5.945482369226E-01  4.673350641912E-03
5.994957977926E-01  4.104395946301E-03
6.044390304920E-01  3.498987642383E-03
6.093776968860E-01  2.857392264163E-03
6.143115556140E-01  2.179816028950E-03
6.192403604371E-01  1.466405282172E-03
6.718273991091E-01 -6.356357400279E-03
6.767526054209E-01 -7.103532789879E-03
6.816758091718E-01 -7.863791140108E-03
6.865969825046E-01 -8.637083913113E-03
6.915161027857E-01 -9.423330869654E-03
6.964331531694E-01 -1.022242034614E-02
7.013481229143E-01 -1.103420957465E-02
7.062610074299E-01 -1.185852504210E-02
7.111718084110E-01 -1.269516294119E-02
7.160805346528E-01 -1.354388980141E-02
7.209872014704E-01 -1.440444298536E-02
7.258918312941E-01 -1.527653143657E-02
7.790625304642E-01 -2.481487691264E-02
8.110596588112E-01 -3.050992276458E-02
8.430658770510E-01 -3.615365990836E-02
8.750811030255E-01 -4.174607385386E-02
8.943340805157E-01 -4.508370668680E-02
9.387146974434E-01 -5.277025088420E-02
9.436116888074E-01 -5.367661140151E-02
9.485004307550E-01 -5.462646566924E-02
9.533807183111E-01 -5.561884698211E-02
9.582523551847E-01 -5.665286202399E-02
9.631151510579E-01 -5.772768930763E-02
9.679689193166E-01 -5.884257778074E-02
9.728134742725E-01 -5.999684531375E-02
9.776486292326E-01 -6.118987749414E-02
9.824741943634E-01 -6.242112640833E-02
9.872899744440E-01 -6.369010944528E-02
9.920957668882E-01 -6.499640824336E-02
9.968913599407E-01 -6.633966775423E-02
1.001676530758E+00 -6.771959533795E-02
1.006445104356E+00 -6.913595995014E-02
1.057337159005E+00 -8.462467062233E-02
1.062100496528E+00 -8.608293956087E-02
1.066860590692E+00 -8.755176094764E-02
1.071617418482E+00 -8.903112640145E-02
1.076370964898E+00 -9.052100190350E-02
```

```
1.081121223279E+00 -9.202132796904E-02
1.085868195296E+00 -9.353201978906E-02
1.090611891278E+00 -9.505296754113E-02
1.095352330135E+00 -9.658403664471E-02
1.100089539829E+00 -9.812506825519E-02
1.104823556974E+00 -9.967587955342E-02
1.109554427271E+00 -1.012362643603E-01
1.311730279888E+00 -1.684059203609E-01
```

18 MeV, B_{Sep}=-6.2 kG

```
3.061515884556E-18  9.950000000000E-02
1.328486710000E-02  7.839941724223E-02
3.139638130000E-02  6.126187542319E-02
5.319836140000E-02  4.916245600550E-02
7.732311390000E-02  4.286018625584E-02
1.000000000000E-01  4.250168343966E-02
1.521272104100E-01  4.765302191339E-02
1.570799382100E-01  4.817514336642E-02
1.620297942000E-01  4.872381826607E-02
1.669765162000E-01  4.930006119760E-02
1.719198183000E-01  4.990493566348E-02
1.768593892000E-01  5.053955564809E-02
1.817948896000E-01  5.120508721612E-02
1.867259499000E-01  5.190275013939E-02
1.916521674000E-01  5.263381954548E-02
1.965731035000E-01  5.339962795081E-02
2.014882801000E-01  5.420156507679E-02
2.063971765000E-01  5.504108321456E-02
2.112992205000E-01  5.591969516508E-02
2.161938095000E-01  5.683897770020E-02
2.210802555000E-01  5.780057275119E-02
2.748381635687E-01  6.890828571200E-02
2.797384249667E-01  6.980331133341E-02
2.846660178767E-01  7.053296873270E-02
2.896155860767E-01  7.109448160696E-02
2.945815138767E-01  7.148569349628E-02
2.995579912767E-01  7.170509163243E-02
3.045390289767E-01  7.175182389105E-02
3.095187960767E-01  7.162570842008E-02
3.144911582767E-01  7.132723570621E-02
3.194502820767E-01  7.085756301008E-02
3.243904382767E-01  7.021850133928E-02
3.293061225767E-01  6.941249526048E-02
3.726442517933E-01  6.057518081648E-02
4.045132614933E-01  5.420269772446E-02
4.364404390933E-01  4.812835520695E-02
4.684229956933E-01  4.235268327933E-02
5.004581367933E-01  3.687618647655E-02
5.490056146205E-01  2.884057073940E-02
5.539176839846E-01  2.801974852304E-02
5.588282930695E-01  2.719023523527E-02
5.637373984870E-01  2.635186879567E-02
5.686449527676E-01  2.550447061023E-02
5.735509049014E-01  2.464784516138E-02
5.784551993706E-01  2.378177977408E-02
5.833577761886E-01  2.290604420086E-02
5.882585709336E-01  2.202039017448E-02
5.931575139861E-01  2.112455104675E-02
5.980545308494E-01  2.021824122952E-02
6.029495409812E-01  1.930115582480E-02
6.078424584001E-01  1.837296995131E-02
6.127331906056E-01  1.743333828835E-02
6.176216384812E-01  1.648189443373E-02
6.215651739788E-01  1.570514406173E-02
6.745770693520E-01  5.192976007550E-03
6.794452848740E-01  4.165910378453E-03
6.843101664842E-01  3.094136833683E-03
6.891652060385E-01  1.978623560896E-03
6.940102478368E-01  8.204540033070E-04
6.988451915119E-01 -3.791771862068E-04
7.036699943727E-01 -1.618968457958E-03
7.084846729497E-01 -2.897515877115E-03
7.132893049909E-01 -4.213317991608E-03
7.180840293449E-01 -5.564780637926E-03
7.228690471944E-01 -6.950222175713E-03
7.276446208874E-01 -8.367878554647E-03
7.853596028028E-01 -2.552853122941E-02
8.167985407854E-01 -3.375945800233E-02
8.484909079921E-01 -4.095312445322E-02
8.804024922101E-01 -4.710176493684E-02
9.331815336077E-01 -5.572794139323E-02
9.375722683276E-01 -5.645665821433E-02
9.424760752637E-01 -5.732532902770E-02
9.473697533766E-01 -5.824936171203E-02
9.522528853890E-01 -5.922760116936E-02
9.571250685540E-01 -6.025899396289E-02
9.619989094524E-01 -6.134258621829E-02
9.668350200608E-01 -6.247752191866E-02
9.716720131072E-01 -6.366304099851E-02
9.764964983722E-01 -6.489847776258E-02
9.813800784053E-01 -6.618325916893E-02
9.861063448939E-01 -6.751690336823E-02
9.908908750149E-01 -6.889901830041E-02
9.956612276714E-01 -7.032930032441E-02
1.000416939995E+00 -7.180753300321E-02
1.005557523638E+00 -7.333358589907E-02
1.055644544296E+00 -9.011121963507E-02
1.060372491851E+00 -9.168044040646E-02
1.065101550752E+00 -9.324630875174E-02
1.069831804957E+00 -9.480856223553E-02
1.074563334902E+00 -9.636694801878E-02
1.079296216647E+00 -9.792122340397E-02
```

```
1.084030522039E+00  -9.947115654312E-02
1.088766318810E+00  -1.010165271810E-01
1.093503669643E+00  -1.025572070132E-01
1.098242632672E+00  -1.040927604534E-01
1.102983260932E+00  -1.056232450417E-01
1.107725602789E+00  -1.071484121118E-01
1.310588641920E+00  -1.721070197523E-01
```

18 MeV, B_{Sep}=-5.8 kG

```
3.061515884556E-18  9.950000000000E-02
1.311780980000E+00  7.828552626081E-02
3.081334570000E-02  6.070716349029E-02
5.211450000000E-02  4.773058251275E-02
7.585108960000E-02  4.006865436248E-02
1.000000000000E-01  3.811583315580E-02
1.521449277700E-01  3.986106719861E-02
1.571218340200E-01  4.004155121815E-02
1.620983167000E-01  4.023335816279E-02
1.670743352000E-01  4.043684937029E-02
1.720498455000E-01  4.065240808224E-02
1.770247996000E-01  4.088044014231E-02
1.819991455000E-01  4.112137473374E-02
1.869728264000E-01  4.137566515668E-02
1.919457806000E-01  4.164378964631E-02
1.969179408000E-01  4.192625223280E-02
2.018892340000E-01  4.222358364374E-02
2.068595803000E-01  4.253634225009E-02
2.118288928000E-01  4.286511505629E-02
2.167970768000E-01  4.321051873550E-02
2.217640293000E-01  4.357320071041E-02
2.748554214597E-01  4.762358028003E-02
2.798276130567E-01  4.792734719868E-02
2.848052497767E-01  4.812249808604E-02
2.897859688767E-01  4.820841493523E-02
2.947673729767E-01  4.818482523577E-02
2.997470568767E-01  4.805180383618E-02
3.047226349767E-01  4.780977243182E-02
3.096917673767E-01  4.745949668746E-02
3.146521868767E-01  4.700208104878E-02
3.196017232767E-01  4.643896133973E-02
3.245383279767E-01  4.577189528294E-02
3.294600960767E-01  4.500295111642E-02
3.726442517933E-01  3.724525104279E-02
4.046913658933E-01  3.184263951538E-02
4.368515689933E-01  2.716000435521E-02
4.691086879933E-01  2.319970041170E-02
5.014465007933E-01  1.996371928129E-02
5.470592473605E-01  1.595032138153E-02
5.520175694142E-01  1.548434700612E-02
5.569727169189E-01  1.498574355115E-02
5.619245247181E-01  1.445499408915E-02
5.668728296074E-01  1.389252150928E-02
5.718174692426E-01  1.329868926055E-02
5.767582805228E-01  1.267380209255E-02
5.816950977718E-01  1.201810674344E-02
5.866277516006E-01  1.133179244098E-02
5.915560675590E-01  1.061499135029E-02
5.964798643789E-01  9.867778997099E-03
6.013989530951E-01  9.090174472665E-03
6.063131348678E-01  8.282140747854E-03
6.112222003745E-01  7.443584664311E-03
6.161259278048E-01  6.574357050065E-03
6.200797915929E-01  5.850275845437E-03
6.731841960519E-01  -4.022207088988E-03
6.780767732080E-01  -4.959540651561E-03
6.829653744469E-01  -5.917394967077E-03
6.878500293285E-01  -6.895176514018E-03
6.927307851437E-01  -7.892239283413E-03
6.976077077395E-01  -8.907886751097E-03
7.024808813049E-01  -9.941373834154E-03
7.073504084543E-01  -1.099190902543E-02
7.122164099942E-01  -1.205865660614E-02
7.170790246743E-01  -1.314073897343E-02
7.219384087236E-01  -1.423723904545E-02
7.267947353716E-01  -1.534720276555E-02
7.850140279534E-01  -2.863921033887E-02
8.168131471476E-01  -3.535056356512E-02
8.487182162655E-01  -4.153868232564E-02
8.807206266108E-01  -4.720189692024E-02
9.331815420549E-01  -5.572788534920E-02
9.375722850974E-01  -5.645560411944E-02
9.424760919257E-01  -5.732527548575E-02
9.473697699617E-01  -5.824930862307E-02
9.522529019660E-01  -5.922754844574E-02
9.571250849624E-01  -6.025894144658E-02
9.619859258183E-01  -6.134253383990E-02
9.668350364147E-01  -6.247746957940E-02
9.716720295750E-01  -6.366298862898E-02
9.764965148890E-01  -6.489842523423E-02
9.813080950017E-01  -6.618320638227E-02
9.861063615053E-01  -6.751685019378E-02
9.908908917679E-01  -6.889896466692E-02
9.956612445973E-01  -7.032924613033E-02
1.000416957126E+00  -7.180747814595E-02
1.005157541005E+00  -7.333353027486E-02
1.055644564334E+00  -9.011115468600E-02
1.060372512134E+00  -9.168037471651E-02
1.065101571192E+00  -9.324624248703E-02
1.069831825633E+00  -9.480849560971E-02
1.074563355624E+00  -9.636688118173E-02
1.079296237282E+00  -9.792115650611E-02
1.084030542724E+00  -9.947108982340E-02
```

18 MeV, B_{Sep}=-5.4 kG

```
1.088766339298E+00  -1.010164607601E-01
1.093503689975E+00  -1.025570610993E-01
1.098242652522239E-01  -1.040926952239E-01
1.102983280883E+00  -1.056231070016E-01
1.107725622326E+00  -1.071483487753E-01
1.310588645361E+00  -1.721070085950E-01
```

```
3.061515884556E-18  9.950000000000E-02
1.294949610000E-02  7.817342319687E-02
3.021794570000E-02  6.016473159810E-02
5.098253480000E-02  4.633201071655E-02
7.425386370000E-02  3.733436770206E-02
9.892309050000E-02  3.360052593400E-02
1.511497328700E-01  3.195285760065E-02
1.561273135300E-01  3.179201584532E-02
1.611047546000E-01  3.162691050035E-02
1.660820417000E-01  3.145722971669E-02
1.710591595000E-01  3.128265303301E-02
1.760360912000E-01  3.110285077528E-02
1.810128188000E-01  3.091748343953E-02
1.859893224000E-01  3.072620105699E-02
1.909655808000E-01  3.052864254026E-02
1.959415708000E-01  3.032443500963E-02
2.009172670000E-01  3.011319309836E-02
2.058926421000E-01  2.989451823563E-02
2.108676661000E-01  2.966799790632E-02
2.158423065000E-01  2.943320488606E-02
2.208165278000E-01  2.918969645073E-02
2.738618404767E-01  2.648548395685E-02
2.788355507067E-01  2.620631533251E-02
2.838061890964E-01  2.587693755228E-02
2.887733162767E-01  2.549826798525E-02
2.937365310767E-01  2.507135913652E-02
2.986954747767E-01  2.459739489128E-02
3.036498335767E-01  2.407768635397E-02
3.085993452767E-01  2.351366731775E-02
3.135437987767E-01  2.290688940146E-02
3.184830355767E-01  2.225901689155E-02
3.234169569767E-01  2.157182132739E-02
3.283455148767E-01  2.084717586719E-02
3.326442517767E-01  2.018540790137E-02
3.983846938933E-01  1.024494618601E-02
4.306925715933E-01  6.733041489869E-03
4.631071964933E-01  4.403379013168E-03
4.955852777933E-01  3.260869319851E-03
5.440633094303E-01  2.796844323998E-03
5.490427243585E-01  2.711250265604E-03
5.540208202473E-01  2.568171192708E-03
5.589969791013E-01  2.368760450024E-03
5.639706159149E-01  2.114071620951E-03
5.689411741996E-01  1.805059649184E-03
5.739081204155E-01  1.442582139259E-03
5.788709396878E-01  1.027400458671E-03
5.838291310258E-01  5.601808943776E-04
5.887822033278E-01  4.149565685759E-05
5.937296710831E-01  -5.281761151546E-04
5.986710503619E-01  -1.148447447559E-03
6.036058548962E-01  -1.819022698592E-03
6.085335923477E-01  -2.539696821554E-03
6.134537646665E-01  -3.310354681544E-03
6.183658431409E-01  -4.130970428341E-03
6.707971885691E-01  -1.318685975075E-02
6.757067843042E-01  -1.403054876653E-02
6.806170873545E-01  -1.487011153550E-02
6.855281384629E-01  -1.570528653726E-02
6.904399760448E-01  -1.653582399979E-02
6.953526354843E-01  -1.736148648230E-02
7.002661491952E-01  -1.818204953940E-02
7.051801546789E-01  -1.899730235603E-02
7.100958545849E-01  -1.980704830084E-02
7.150120962395E-01  -2.061110547101E-02
7.199292919633E-01  -2.140930716728E-02
7.248474589565E-01  -2.220150237250E-02
7.781732694731E-01  -3.074433842176E-02
8.102624959244E-01  -3.589521484729E-02
8.423498411099E-01  -4.105779837895E-02
8.744353001907E-01  -4.623208824397E-02
8.936920499563E-01  -4.934330112851E-02
9.365903508360E-01  -5.628960758477E-02
9.414961316563E-01  -5.714705949367E-02
9.463918692292E-01  -5.806011651343E-02
9.512771429762E-01  -5.902760303549E-02
9.561515474239E-01  -6.004445386682E-02
9.610146978037E-01  -6.112166998061E-02
9.658661751930E-01  -6.224640132361E-02
9.707056228278E-01  -6.342186040040E-02
9.755326410687E-01  -6.464736267255E-02
9.803468343618E-01  -6.592231673585E-02
9.851477968467E-01  -6.724622261329E-02
9.899351089985E-01  -6.861867042805E-02
9.947083334858E-01  -7.003933890258E-02
9.994670121562E-01  -7.150799427729E-02
1.004210662043E+00  -7.302448900346E-02
1.054699102310E+00  -8.979692620224E-02
1.059426838161E+00  -9.136678467408E-02
1.064155668047E+00  -9.293334447487E-02
1.068885676770E+00  -9.449634137472E-02
1.073616945238E+00  -9.605552049749E-02
1.078349550265E+00  -9.761063712639E-02
1.083083565615E+00  -9.916145716991E-02
1.087819058715E+00  -1.007077580028E-01
```

```
1.092556093690E+00  -1.022493288953E-01
1.097294729484E+00  -1.037859716365E-01
1.102035020356E+00  -1.053175011570E-01
1.106777015446E+00  -1.068437459381E-01
1.110579997461E+00  -1.080634334506E-01
1.310588640819E+00  -1.721070233194E-01
```

16 MeV, B_{Sep}=-5.6 kG

```
3.061515884556E-18   9.950000000000E-02
1.331760540000E-02   7.842205314728E-02
3.150981990000E-02   6.137266047966E-02
5.340630720000E-02   4.944863850712E-02
7.759842900000E-02   4.341707990093E-02
1.000000000000E-01   4.335022999196E-02
1.521215217100E-01   4.918073507240E-02
1.570661482300E-01   4.977467124462E-02
1.620066874000E-01   5.040169364515E-02
1.669427414000E-01   5.106309160966E-02
1.718738750000E-01   5.176022136439E-02
1.767996116000E-01   5.249450801654E-02
1.817194299000E-01   5.326744756115E-02
1.866327593000E-01   5.408060888993E-02
1.915389750000E-01   5.493563578482E-02
1.964373936000E-01   5.583424887614E-02
2.013272670000E-01   5.677824754165E-02
2.062077767000E-01   5.776951171864E-02
2.110780269000E-01   5.881000359691E-02
2.159370380000E-01   5.990176915477E-02
2.207837384000E-01   6.104693949480E-02
2.738618404767E-01   7.431125830332E-02
2.787177761167E-01   7.542138745693E-02
2.836152425467E-01   7.633090168398E-02
2.885463461767E-01   7.703554765728E-02
2.935027353767E-01   7.753198719896E-02
2.984757112767E-01   7.781784575930E-02
3.034563461767E-01   7.789174744844E-02
3.084356061767E-01   7.775333554175E-02
3.134044766767E-01   7.740327782081E-02
3.183540866767E-01   7.684325658326E-02
3.232758306767E-01   7.607594363332E-02
3.281614847767E-01   7.510496102924E-02
3.326442517767E-01   7.402876071570E-02
3.978615306933E-01   5.729845644003E-02
4.295271537933E-01   4.998413373077E-02
4.613397073933E-01   4.333789899118E-02
4.932850977933E-01   3.736269668344E-02
5.478807865329E-01   2.806046679155E-02
5.527892724822E-01   2.721848415522E-02
5.576957294435E-01   2.636475781057E-02
5.626000877489E-01   2.549905690523E-02
5.675022713213E-01   2.462112562333E-02
5.724021977092E-01   2.373068263130E-02
5.772997771079E-01   2.282742602308E-02
5.821949123619E-01   2.191100566346E-02
5.870874981675E-01   2.098107659666E-02
5.919774208610E-01   2.003724431077E-02
5.968645575062E-01   1.907909105060E-02
6.017487754674E-01   1.810616959926E-02
6.066299316776E-01   1.711800244647E-02
6.115078717980E-01   1.611408091288E-02
6.163824266665E-01   1.509386416972E-02
6.212534262413E-01   1.405677827196E-02
6.732142394941E-01   2.886709074562E-03
6.780741225611E-01   1.792489255654E-03
6.829242480878E-01   6.557960710513E-04
6.877645312229E-01  -5.221075725560E-04
6.925949489813E-01  -1.739839438870E-03
6.974155424258E-01  -2.995903280316E-03
7.022264175205E-01  -4.288694313207E-03
7.070277461748E-01  -5.616505040083E-03
7.118197663560E-01  -6.977531211722E-03
7.166027810785E-01  -8.369877862224E-03
7.213771578571E-01  -9.791565620254E-03
7.261433264540E-01  -1.124053693517E-02
7.785585970480E-01  -2.731051661156E-02
8.099174090116E-01  -3.583995922696E-02
8.415736723737E-01  -4.318893661809E-02
8.734829665481E-01  -4.934713657596E-02
8.932104070710E-01  -5.253879287990E-02
9.357696230056E-01  -5.893521944642E-02
9.406825563987E-01  -5.975060887366E-02
9.455836982262E-01  -6.063412402440E-02
9.504723466116E-01  -6.158434532724E-02
9.553478240741E-01  -6.259999033592E-02
9.602094694749E-01  -6.367991120340E-02
9.650566306077E-01  -6.482309227506E-02
9.698886567923E-01  -6.602864763755E-02
9.747048921414E-01  -6.729581885843E-02
9.795046689215E-01  -6.862397276063E-02
9.842873010033E-01  -7.001259924826E-02
9.890520773005E-01  -7.146130916670E-02
9.937982558651E-01  -7.296983241190E-02
9.985250573941E-01  -7.453801591029E-02
1.003231658817E+00  -7.616582167702E-02
1.053312656790E+00  -9.429167218253E-02
1.057999493284E+00  -9.597971220285E-02
1.062692554772E+00  -9.765036693325E-02
1.067391990161E+00  -9.930300679157E-02
1.072097922337E+00  -1.009370543979E-01
1.076810448427E+00  -1.025519665957E-01
1.081529639712E+00  -1.041473361738E-01
1.086255542150E+00  -1.057226935814E-01
```

16 MeV, B_{Sep}=-5.1 kG

```
1.090988177050E+00  -1.072777084849E-01
1.095727541326E+00  -1.088120909844E-01
1.100473608474E+00  -1.103256128417E-01
1.105226329715E+00  -1.118181085362E-01
1.109056061108E+00  -1.130039137675E-01
1.309770860734E+00  -1.747582012407E-01

3.061515884556E-18   9.950000000000E-02
1.308346050000E-02   7.826243937312E-02
3.069261890000E-02   6.059528172216E-02
5.188704270000E-02   4.744205707768E-02
7.553482520000E-02   3.950522492390E-02
1.000000000000E-01   3.720049543283E-02
1.521463990600E-01   3.825429493714E-02
1.571253197400E-01   3.836620001067E-02
1.621040263000E-01   3.848725589250E-02
1.670824952000E-01   3.861771870938E-02
1.720607009000E-01   3.875786445136E-02
1.770386156000E-01   3.890798954518E-02
1.820162090000E-01   3.906841146936E-02
1.869934482000E-01   3.923946941180E-02
1.919702972000E-01   3.942152497112E-02
1.969467167000E-01   3.961496290286E-02
2.019226638000E-01   3.982019191173E-02
2.068980916000E-01   4.003764549115E-02
2.118729488000E-01   4.026778281129E-02
2.168471791000E-01   4.051108965699E-02
2.218207212000E-01   4.076807941686E-02
2.748568032977E-01   4.364314367395E-02
2.798344990967E-01   4.383676862190E-02
2.848152489767E-01   4.392084376382E-02
2.897966416767E-01   4.389507477905E-02
2.947762575767E-01   4.375955190764E-02
2.997516996767E-01   4.351474929604E-02
3.047206228767E-01   4.316152157007E-02
3.096807640767E-01   4.270109770462E-02
3.146299692767E-01   4.213507231337E-02
3.195662210767E-01   4.146539453175E-02
3.244876623767E-01   4.069435471115E-02
3.293926192767E-01   3.982456918021E-02
3.726442517933E-01   3.115652944196E-02
4.046070440933E-01   2.527990619529E-02
4.367457907933E-01   2.045748392339E-02
4.690257316933E-01   1.669447840522E-02
5.014119537933E-01   1.399495955659E-02
5.463169677137E-01   1.104631437894E-02
5.512834705198E-01   1.067761221444E-02
5.562462577421E-01   1.026199004114E-02
5.612049606520E-01   9.800178727829E-03
5.661592102165E-01   9.292813859261E-03
5.711086436902E-01   8.740436933148E-03
5.760529006096E-01   8.143496564359E-03
5.809916197020E-01   7.502349446610E-03
5.859244354814E-01   6.817261251235E-03
5.908509748279E-01   6.088407414386E-03
5.957708538459E-01   5.315873765311E-03
6.006836746063E-01   4.499657053797E-03
6.055890216739E-01   3.639665391368E-03
6.104864591109E-01   2.735718502667E-03
6.153755267719E-01   1.787547967843E-03
6.193462215943E-01   9.833569073500E-04
6.722877802774E-01  -9.947037498413E-03
6.771648875378E-01  -1.096181090465E-02
6.820409497578E-01  -1.198159414937E-02
6.869161366389E-01  -1.300555448468E-02
6.917906225082E-01  -1.403284703962E-02
6.966645855630E-01  -1.506261724808E-02
7.015382068629E-01  -1.609400335909E-02
7.064116695845E-01  -1.712613897018E-02
7.112851575405E-01  -1.815815546959E-02
7.161588544900E-01  -1.918918460381E-02
7.210329429532E-01  -2.021836096953E-02
7.259076034239E-01  -2.124482455728E-02
7.843137305687E-01  -3.343496230790E-02
8.162214301567E-01  -3.960991372979E-02
8.482157026498E-01  -4.531936594132E-02
8.802897568194E-01  -5.056210704491E-02
9.327679269410E-01  -5.847204232831E-02
9.367531182940E-01  -5.909277446758E-02
9.416637509625E-01  -5.992190926826E-02
9.465624493484E-01  -6.081887478952E-02
9.514485171277E-01  -6.178227909087E-02
9.563212806805E-01  -6.281086683513E-02
9.611800812246E-01  -6.390351680117E-02
9.660242674857E-01  -6.505923949016E-02
9.708531882920E-01  -6.627717466941E-02
9.756661858419E-01  -6.755658911153E-02
9.804625892547E-01  -6.889687443102E-02
9.852417079235E-01  -7.029754488663E-02
9.900028251429E-01  -7.175823530841E-02
9.947451920098E-01  -7.327869915725E-02
9.994680208321E-01  -7.485880648515E-02
1.004170479191E+00  -7.649854215039E-02
1.054249534106E+00  -9.463063909068E-02
1.058937602448E+00  -9.631525485880E-02
1.063631927680E+00  -9.798235535376E-02
1.068332653407E+00  -9.963132123989E-02
1.073039897422E+00  -1.012615858505E-01
1.077753751654E+00  -1.028726370758E-01
1.082474282297E+00  -1.044640191116E-01
1.087201530329E+00  -1.060353341344E-01
```

```
1.091935512016E+00 -1.075862437613E-01
1.096676219737E+00 -1.091164704049E-01
1.101423622416E+00 -1.106257982841E-01
1.106177666569E+00 -1.121140744110E-01
1.309770860734E+00 -1.747582012407E-01
```

16 MeV, B_{Sep}=-4.6 kG

```
3.061515884556E-18  9.950000000000E-02
1.284685640000E-02  7.810634386525E-02
2.985124880000E-02  5.984214725243E-02
5.027376330000E-02  4.550160525463E-02
7.322635290000E-02  3.570829789175E-02
9.771095400000E-02  3.088807453553E-02
1.511435716900E-01  2.707734797840E-02
1.561101190500E-01  2.670915119435E-02
1.610754917000E-01  2.632544060977E-02
1.660395759000E-01  2.592540917646E-02
1.710022471000E-01  2.550821617846E-02
1.759633685000E-01  2.507298558695E-02
1.809227907000E-01  2.461880436037E-02
1.858803496000E-01  2.414472068935E-02
1.908358656000E-01  2.364974218596E-02
1.957891417000E-01  2.313283401743E-02
2.007399622000E-01  2.259291698482E-02
2.056880906000E-01  2.202886554767E-02
2.106332680000E-01  2.143950579642E-02
2.155752104000E-01  2.082361337484E-02
2.205136069000E-01  2.017991135594E-02
2.738618404767E-01  1.285440654849E-02
2.787959444367E-01  1.216844594904E-02
2.837280953367E-01  1.146857720911E-02
2.886585560767E-01  1.075689587719E-02
2.935876095767E-01  1.003553069124E-02
2.985155557767E-01  9.306637515600E-03
3.034427077767E-01  8.572393250086E-03
3.083693880767E-01  7.834989719219E-03
3.132959247767E-01  7.096627548052E-03
3.182226478767E-01  6.359510030432E-03
3.231498848767E-01  5.625836995015E-03
3.280779574767E-01  4.897798674197E-03
3.326442517767E-01  4.230277873455E-03
3.984377986933E-01 -4.839989589754E-03
4.308211470933E-01 -7.556122143204E-03
4.632959022933E-01 -8.759825172475E-03
4.957914667933E-01 -8.448481910590E-03
5.426565903201E-01 -6.479964648086E-03
5.476343561969E-01 -6.326900572318E-03
5.526139962667E-01 -6.257677694439E-03
5.575941029662E-01 -6.270597369748E-03
5.625733502990E-01 -6.364110077789E-03
5.675504818995E-01 -6.536815095623E-03
5.725242991688E-01 -6.787459836182E-03
5.774936502724E-01 -7.114939038255E-03
5.824574197642E-01 -7.518293829842E-03
5.874145186311E-01 -7.996710681937E-03
5.923638740606E-01 -8.549520186854E-03
5.973044204106E-01 -9.176195915349E-03
6.022350900913E-01 -9.876353182197E-03
6.071548039623E-01 -1.064974767721E-02
6.120624627252E-01 -1.149627419525E-02
6.169569378299E-01 -1.241596524534E-02
6.693578079370E-01 -2.272272468431E-02
6.742525721647E-01 -2.364853833525E-02
6.791535487108E-01 -2.454087985662E-02
6.840605878471E-01 -2.539925607325E-02
6.889735128071E-01 -2.622327637173E-02
6.938921225261E-01 -2.701265438260E-02
6.988161946640E-01 -2.776720933172E-02
7.037454879015E-01 -2.848686690271E-02
7.086797454811E-01 -2.917165990370E-02
7.136186980125E-01 -2.982172843932E-02
7.185620664333E-01 -3.043731972386E-02
7.235095648283E-01 -3.101878749503E-02
7.772085486989E-01 -3.709337929790E-02
8.094729873523E-01 -4.099832440908E-02
8.417002597657E-01 -4.519898042801E-02
8.738876561149E-01 -4.969499415095E-02
8.932104070703E-01 -5.253879288457E-02
9.357696230073E-01 -5.893521944063E-02
9.406825564009E-01 -5.975060886668E-02
9.455836982287E-01 -6.063412401622E-02
9.504723466145E-01 -6.158434531783E-02
9.553478240774E-01 -6.259999032526E-02
9.602094694785E-01 -6.367991119148E-02
9.650566306118E-01 -6.482309226184E-02
9.698886567968E-01 -6.602864762300E-02
9.747048921463E-01 -6.729581884253E-02
9.795046689268E-01 -6.862397274334E-02
9.842873010090E-01 -7.001259922954E-02
9.890520773067E-01 -7.146130914651E-02
9.937982558718E-01 -7.296983239020E-02
9.985250574013E-01 -7.453801588703E-02
1.003231658825E+00 -7.616582165216E-02
1.053312656803E+00 -9.429167214000E-02
1.057999493298E+00 -9.597971215873E-02
1.062692554786E+00 -9.765036688768E-02
1.067391990176E+00 -9.930300674467E-02
1.072097922352E+00 -1.009370543498E-01
1.076810448442E+00 -1.025519865466E-01
1.081529639727E+00 -1.041473061238E-01
1.086255542165E+00 -1.057226935307E-01
1.090988177066E+00 -1.072777084336E-01
```

```
1.095727541342E+00 -1.088120909327E-01
1.100473608490E+00 -1.103256127897E-01
1.105226329731E+00 -1.118181084841E-01
1.109056061124E+00 -1.130039137154E-01
1.309770860749E+00 -1.747582011925E-01
```

15 MeV, B_{Sep}=-5.2 kG

```
3.061515884556E-18  9.950000000000E-02
1.328767190000E-02  7.840135206066E-02
3.140610050000E-02  6.127132831906E-02
5.321621070000E-02  4.918686460186E-02
7.734683740000E-02  4.290769084983E-02
1.000000000000E-01  4.257437328800E-02
1.521266006600E-01  4.778509480694E-02
1.570780215300E-01  4.831944390944E-02
1.620258827000E-01  4.888580137646E-02
1.669698234000E-01  4.948541232995E-02
1.719094481000E-01  5.011959179666E-02
1.768443225000E-01  5.078972688819E-02
1.817739703000E-01  5.149727902399E-02
1.866978684000E-01  5.224378618452E-02
1.916154431000E-01  5.303086517883E-02
1.965266644000E-01  5.386021390823E-02
2.014290411000E-01  5.473361360393E-02
2.063236142000E-01  5.565293101267E-02
2.112089531000E-01  5.662012049968E-02
2.160841386000E-01  5.763722603300E-02
2.209481737000E-01  5.870638300705E-02
2.748331329497E-01  7.123280983101E-02
2.797152391067E-01  7.222146212155E-02
2.846343232767E-01  7.300562156318E-02
2.895821178767E-01  7.358142235682E-02
2.945499393767E-01  7.394599738504E-02
2.995288126767E-01  7.409751282910E-02
3.045096005767E-01  7.403520535954E-02
3.094831380767E-01  7.375938948436E-02
3.144403663767E-01  7.327145356703E-02
3.193724646767E-01  7.257383837446E-02
3.242709772767E-01  7.166999975421E-02
3.291279325767E-01  7.056435664621E-02
3.726442517767E-01  5.839994060070E-02
4.040656524933E-01  5.010173031015E-02
4.357300947933E-01  4.278545994783E-02
4.676069001933E-01  3.645821795184E-02
4.996651847933E-01  3.112613453072E-02
5.482694031485E-01  2.395471133330E-02
5.531934695456E-01  2.320925013594E-02
5.581142721582E-01  2.244254046496E-02
5.630317104274E-01  2.165454148759E-02
5.679456753311E-01  2.084516487759E-02
5.728560482939E-01  2.001427475878E-02
5.777627004089E-01  1.916168751400E-02
5.826654914862E-01  1.828717150179E-02
5.875642690860E-01  1.739044668755E-02
5.924588674391E-01  1.647118418554E-02
5.973491060544E-01  1.552900574750E-02
6.022347891040E-01  1.456348303316E-02
6.071157034078E-01  1.357413699041E-02
6.119916176895E-01  1.256043694298E-02
6.168622807294E-01  1.152179974364E-02
6.208049621490E-01  1.066146192592E-02
6.736327185174E-01 -9.975474958865E-04
6.784872794113E-01 -2.115170131314E-03
6.833340587853E-01 -3.266073633567E-03
6.881731457312E-01 -4.448906950632E-03
6.930046807806E-01 -5.662221870315E-03
6.978288565242E-01 -6.904478300799E-03
7.026459167231E-01 -8.174049599972E-03
7.074561558641E-01 -9.469228214842E-03
7.122599175948E-01 -1.078823136712E-02
7.170575928343E-01 -1.212920687707E-02
7.218496175644E-01 -1.349023910010E-02
7.266364007000E-01 -1.486935490772E-02
7.844929273705E-01 -3.144976690556E-02
8.160269113718E-01 -3.930797233887E-02
8.478150642567E-01 -4.606495976593E-02
8.798189414842E-01 -5.171255732565E-02
9.326263695902E-01 -5.941121398554E-02
9.364730360698E-01 -5.999012643888E-02
9.413870687111E-01 -6.079881738642E-02
9.462882977325E-01 -6.168180630321E-02
9.511758601462E-01 -6.263756007922E-02
9.560489210622E-01 -6.366470305753E-02
9.609066637922E-01 -6.476201424254E-02
9.657482805639E-01 -6.592842456129E-02
9.705729631468E-01 -6.716301400611E-02
9.753798942576E-01 -6.846500896530E-02
9.801682393541E-01 -6.983377964706E-02
9.849371379534E-01 -7.126883735495E-02
9.896856955186E-01 -7.276983195122E-02
9.944129757223E-01 -7.433654945798E-02
9.991179921299E-01 -7.596890950423E-02
1.003799699876E+00 -7.766696279274E-02
1.053671217718E+00 -9.650297708910E-02
1.058337505474E+00 -9.824700856095E-02
1.063012934195E+00 -9.996638342780E-02
1.067692963572E+00 -1.016602536772E-01
1.072391808240E+00 -1.033278494852E-01
1.077095444921E+00 -1.049684819204E-01
1.081808066790E+00 -1.065815460143E-01
1.086531287853E+00 -1.081665231284E-01
1.091263443686E+00 -1.097229832456E-01
```

```
1.096004993217E+00  -1.112505870011E-01
1.100755820605E+00  -1.127490873857E-01
1.105515777327E+00  -1.142183311428E-01
1.309490906521E+00  -1.756657905073E-01
```

15 MeV, B_{Sep}=-5 kG

```
3.061515884556E-18  9.950000000000E-02
1.318813690000E-02  7.833314957254E-02
3.105977400000E-02  6.093869365169E-02
5.257570400000E-02  4.832809230539E-02
7.648480970000E-02  4.123463203325E-02
1.000000000000E-00  3.997648244874E-02
1.521395444200E-01  4.314872890487E-02
1.571088826500E-01  4.347709132099E-02
1.620767723000E-01  4.382668234475E-02
1.670430639000E-01  4.419828232209E-02
1.720075935000E-01  4.459271991768E-02
1.769701814000E-01  4.501087377714E-02
1.819306305000E-01  4.545367427027E-02
1.868887245000E-01  4.592210531415E-02
1.918442258000E-01  4.641720627497E-02
1.967968738000E-01  4.694007394626E-02
2.017463823000E-01  4.749186460066E-02
2.066924370000E-01  4.807379611147E-02
2.116346926000E-01  4.868715013885E-02
2.165727701000E-01  4.933327437463E-02
2.215062531000E-01  5.001358483761E-02
2.748482835537E-01  5.774578842344E-02
2.797929901267E-01  5.834879904245E-02
2.847547975767E-01  5.878944198370E-02
2.897284558767E-01  5.906583132909E-02
2.947085503767E-01  5.917677784039E-02
2.996895768767E-01  5.912180276567E-02
3.046660183767E-01  5.890114343283E-02
3.096324214767E-01  5.851575047419E-02
3.145834722767E-01  5.796727675951E-02
3.195140697767E-01  5.725805834596E-02
3.244193946767E-01  5.639108797092E-02
3.292949737767E-01  5.536998181073E-02
3.726442517933E-01  4.465440466761E-02
4.043156879933E-01  3.736965671380E-02
4.362173082933E-01  3.117013662872E-02
4.683119383933E-01  2.606306857006E-02
5.005621787933E-01  2.205440368638E-02
5.472430480387E-01  1.715802333823E-02
5.521925254649E-01  1.660598961446E-02
5.571378161699E-01  1.601762687308E-02
5.620786972959E-01  1.539331447974E-02
5.670149430458E-01  1.473335177803E-02
5.719463225450E-01  1.403795886659E-02
5.768725969316E-01  1.330727735695E-02
5.817935178016E-01  1.254137079060E-02
5.867088244465E-01  1.174022510048E-02
5.916182419610E-01  1.090374880386E-02
5.965214787371E-01  1.003177315037E-02
6.014182237405E-01  9.124052166606E-03
6.063081448543E-01  8.180262404855E-03
6.111908853249E-01  7.200002845320E-03
6.160660619686E-01  6.182794402973E-03
6.200018234744E-01  5.332291178052E-03
6.728408525981E-01  -6.256020218785E-03
6.777016757035E-01  -7.346118931682E-03
6.825587089147E-01  -8.452983186005E-03
6.874121626625E-01  -9.575440088718E-03
6.922622704588E-01  -1.071226929094E-02
6.971092873373E-01  -1.186220681998E-02
7.019534887616E-01  -1.302394910719E-02
7.067951685073E-01  -1.419615697302E-02
7.116346375188E-01  -1.537745985717E-02
7.164722213691E-01  -1.656645992338E-02
7.213082584013E-01  -1.776173633939E-02
7.261430975644E-01  -1.896184957118E-02
7.842924160817E-01  -3.327062584926E-02
8.160359189923E-01  -4.023800172424E-02
8.479446213353E-01  -4.640476919200E-02
8.799983339486E-01  -5.176702644592E-02
9.326263695910E-01  -5.941121397999E-02
9.364730360715E-01  -5.999012643345E-02
9.413870687127E-01  -6.079881738097E-02
9.462882977342E-01  -6.168180629774E-02
9.511758601479E-01  -6.263756007370E-02
9.560489210639E-01  -6.366470305196E-02
9.609066637939E-01  -6.476201423691E-02
9.657482805656E-01  -6.592842455548E-02
9.705729631486E-01  -6.716301040031E-02
9.753798942594E-01  -6.846500895940E-02
9.801682393560E-01  -6.983377964104E-02
9.849371379553E-01  -7.126883734880E-02
9.896856955205E-01  -7.276983194492E-02
9.944129757243E-01  -7.433654945153E-02
9.991179921320E-01  -7.596890949760E-02
1.003799699878E+00  -7.766696278592E-02
1.053671217721E+00  -9.650297708011E-02
1.058337505477E+00  -9.824700855178E-02
1.063012934198E+00  -9.996638341848E-02
1.067697662826E+00  -1.016602536677E-01
1.072391808243E+00  -1.033278494757E-01
1.077095444924E+00  -1.049684819108E-01
1.081808606793E+00  -1.065815460047E-01
1.086531287856E+00  -1.081665231188E-01
1.091263443689E+00  -1.097229832360E-01
1.096004993219E+00  -1.112505869916E-01
```

15 MeV, B_{Sep}=-4.7 kG

```
3.061515884556E-18  9.950000000000E-02
1.303799070000E-02  7.823203653029E-02
3.053196480000E-02  6.044787659666E-02
5.158257280000E-02  4.706178774199E-02
7.510762210000E-02  3.876193666137E-02
9.989771120000E-02  3.597501117598E-02
1.511512179200E-01  3.610860508426E-02
1.561313639300E-01  3.612662203061E-02
1.611114908000E-01  3.614932900493E-02
1.660915937000E-01  3.617677722956E-02
1.710716679000E-01  3.620902862124E-02
1.760517037000E-01  3.624615593085E-02
1.810317088000E-01  3.628824290391E-02
1.860116642000E-01  3.633538447466E-02
1.909915681000E-01  3.638768697334E-02
1.959714138000E-01  3.644526836790E-02
2.009511939000E-01  3.650825852826E-02
2.059309008000E-01  3.657679951771E-02
2.109105258000E-01  3.665104591163E-02
2.158900598000E-01  3.673116514410E-02
2.208694927000E-01  3.681733788317E-02
2.738618404767E-01  3.780653257965E-02
2.788431236267E-01  3.785091695978E-02
2.838243220067E-01  3.779786271328E-02
2.888035354767E-01  3.764756044533E-02
2.937788900767E-01  3.740054956252E-02
2.987485627767E-01  3.705771470207E-02
3.037108055767E-01  3.662027992587E-02
3.086639680767E-01  3.608980078917E-02
3.136065190767E-01  3.546815443226E-02
3.185370664767E-01  3.475752787697E-02
3.234543743767E-01  3.396040473818E-02
3.283573792767E-01  3.307955058194E-02
3.326442517767E-01  3.224063259248E-02
3.982024685933E-01  1.935213169498E-02
4.303426202933E-01  1.454372200504E-02
4.626488573933E-01  1.101991750195E-02
4.950698567933E-01  8.786316295935E-03
5.446685324718E-01  6.786892591236E-03
5.496429218660E-01  6.547462716316E-03
5.546140744299E-01  6.248248244823E-03
5.595813428296E-01  5.890294110307E-03
5.645441087777E-01  5.474519191599E-03
5.695017664447E-01  5.001717919857E-03
5.744537266096E-01  4.472561723609E-03
5.793994055028E-01  3.887600450281E-03
5.843382202297E-01  3.247263615240E-03
5.892695831807E-01  2.551861556343E-03
5.941928962273E-01  1.801586155537E-03
5.991075458913E-01  9.965134633966E-04
6.040128973103E-01  1.366009920439E-04
6.089082890768E-01  -7.783080358597E-04
6.137930274678E-01  -1.748485856049E-03
6.186663809562E-01  -2.774319316198E-03
6.706625024717E-01  -1.404460157294E-02
6.755327122812E-01  -1.509197634946E-02
6.804046917931E-01  -1.613108725248E-02
6.852786272456E-01  -1.716098423053E-02
6.901546933168E-01  -1.818074568506E-02
6.950330520034E-01  -1.918948134898E-02
6.999138523545E-01  -2.018633519405E-02
7.047972293609E-01  -2.117048810439E-02
7.096833035531E-01  -2.214116053990E-02
7.145721807180E-01  -2.309761509103E-02
7.194639511399E-01  -2.403915882614E-02
7.243586900508E-01  -2.496514567588E-02
7.775447695082E-01  -3.487055211497E-02
8.095467955279E-01  -4.053719012169E-02
8.416060807617E-01  -4.587035912400E-02
8.737191508472E-01  -5.086948114428E-02
8.930336378190E-01  -5.371158023738E-02
9.354887799246E-01  -5.983741877626E-02
9.404052689120E-01  -6.063103695174E-02
9.453091315425E-01  -6.149927883262E-02
9.501994977823E-01  -6.244057939311E-02
9.550755278955E-01  -6.345353166524E-02
9.599364025184E-01  -6.453688397153E-02
9.647813127374E-01  -6.568953701295E-02
9.696094511879E-01  -6.691054117301E-02
9.744200030751E-01  -6.819909373711E-02
9.792121379677E-01  -6.955453632010E-02
9.839850012111E-01  -7.097635216999E-02
9.887377058158E-01  -7.246416362814E-02
9.934693244351E-01  -7.401772963763E-02
9.981788813363E-01  -7.563694327426E-02
1.002865344175E+00  -7.732182923937E-02
1.052739182909E+00  -9.615082884291E-02
1.057403672127E+00  -9.789665511437E-02
1.062077264671E+00  -9.962402493479E-02
1.066760128144E+00  -1.013230451557E-01
1.071452387731E+00  -1.029959401021E-01
1.076154126292E+00  -1.046420044739E-01
1.080865385902E+00  -1.062606163815E-01
1.085586168260E+00  -1.078512397101E-01
1.090316436637E+00  -1.094134266220E-01
1.095056117253E+00  -1.109468195339E-01
1.099805100951E+00  -1.124511528271E-01
```

1.104563245544E+00 -1.139262544009E-01
1.108410843693E+00 -1.150956572508E-01
1.309491067711E+00 -1.756652679441E-01

14 MeV, B_{Sep}=-5.1 kG

3.061515884556E-18   9.950000000000E-02
1.341229360000E-02   7.848808991389E-02
3.183569080000E-02   6.169617455150E-02
5.399768430000E-02   5.028407443362E-02
7.836754130000E-02   4.504002530440E-02
1.000000000000E-01   4.577980372791E-02
1.521011741400E-01   5.359103192819E-02
1.570170991700E-01   5.438832055720E-02
1.619249285000E-01   5.523400546906E-02
1.668238189000E-01   5.613001143286E-02
1.717128431000E-01   5.707836608370E-02
1.765909814000E-01   5.808120189405E-02
1.814571122000E-01   5.914075794476E-02
1.863100024000E-01   6.025938143133E-02
1.911482960000E-01   6.143952883011E-02
1.959705022000E-01   6.268376663746E-02
2.007749825000E-01   6.399477158043E-02
2.055599364000E-01   6.537533018208E-02
2.103233860000E-01   6.682833754646E-02
2.150631595000E-01   6.835679520831E-02
2.197768728000E-01   6.996380786954E-02
2.238618405000E-01   7.143097301075E-02
2.776320147867E-01   9.112024204462E-02
2.824218479267E-01   9.248642420838E-02
2.872834164767E-01   9.356989182184E-02
2.922006469767E-01   9.436326179813E-02
2.971565223767E-01   9.486103699820E-02
3.021333630767E-01   9.505972883669E-02
3.071131273767E-01   9.495793624581E-02
3.120777226767E-01   9.455637763926E-02
3.170093192767E-01   9.385787450399E-02
3.218906541767E-01   9.286728732526E-02
3.267053206767E-01   9.159140658027E-02
3.314380303767E-01   9.003880338624E-02
3.848481633933E-01   7.004702932531E-02
4.156766158933E-01   5.976615275937E-02
4.469153664933E-01   5.080901174906E-02
4.785076037933E-01   4.319189587944E-02
5.026442517933E-01   3.832150876403E-02
5.510954616127E-01   2.935404030709E-02
5.559903742813E-01   2.843643287169E-02
5.608835264533E-01   2.750948376921E-02
5.657748152677E-01   2.657275257271E-02
5.706641308197E-01   2.562577580796E-02
5.755513552327E-01   2.466806596185E-02
5.804363622852E-01   2.369911035049E-02
5.853190169308E-01   2.271836994464E-02
5.901991743140E-01   2.172527820989E-02
5.950766789749E-01   2.071923985515E-02
5.999513644396E-01   1.969962945727E-02
6.048230519109E-01   1.866579015352E-02
6.096915493435E-01   1.761703220578E-02
6.145566505097E-01   1.655263149413E-02
6.194181337562E-01   1.547182798232E-02
6.713333991974E-01   3.753709923868E-03
6.761844483626E-01   2.620997195789E-03
6.810235443972E-01   1.438255317198E-03
6.858505520694E-01   2.071017658380E-04
6.906654260277E-01 -1.070687484920E-03
6.954682137316E-01 -2.393185938874E-03
7.002590572897E-01 -3.758324911578E-03
7.050381948753E-01 -5.163902255449E-03
7.098059596130E-01 -6.607591087002E-03
7.145627795073E-01 -8.086948985879E-03
7.193091739713E-01 -9.599426932013E-03
7.240457513167E-01 -1.114237857884E-02
7.658796706121E-01 -2.508723320853E-02
7.969374756489E-01 -3.465141671999E-02
8.284051245541E-01 -4.276609026076E-02
8.602150061411E-01 -4.941381867777E-02
8.922987732552E-01 -5.458031859700E-02
9.333205014884E-01 -6.018044582662E-02
9.382465393037E-01 -6.091239160104E-02
9.431596821394E-01 -6.172642122998E-02
9.480588527024E-01 -6.262071745287E-02
9.529430174312E-01 -6.359364628001E-02
9.578111735087E-01 -6.464375384341E-02
9.626623368764E-01 -6.576976328527E-02
9.674955296084E-01 -6.697057124705E-02
9.723097696194E-01 -6.824524094308E-02
9.771040589674E-01 -6.959301864743E-02
9.818773737987E-01 -7.101329075839E-02
9.866286535395E-01 -7.250562041090E-02
9.913567910503E-01 -7.406972449677E-02
9.960606218297E-01 -7.570547431930E-02
1.000738914084E+00 -7.741289320287E-02
1.005390357946E+00 -7.919214960652E-02
1.055078954676E+00 -9.867907690275E-02
1.059729464925E+00 -1.004647432071E-01
1.064392045914E+00 -1.022186480296E-01
1.069066838710E+00 -1.039397378549E-01
1.073753922666E+00 -1.056270661058E-01
1.078453317063E+00 -1.072797974338E-01
1.083164982965E+00 -1.088972115987E-01
1.087888882063E+00 -1.104780777483E-01
1.092624699091E+00 -1.120238044430E-01
1.097372405540E+00 -1.135321485392E-01

1.102131702671E+00 -1.150035112996E-01
1.309301222480E+00 -1.762807310644E-01

14 MeV, B_{Sep}=-4.6 kG

3.061515884556E-18   9.950000000000E-02
1.314680300000E-02   7.830510796053E-02
3.091525280000E-02   6.080242049647E-02
5.230584520000E-02   4.797649229408E-02
7.611532450000E-02   4.054880271152E-02
1.000000000000E-01   3.888749183781E-02
1.521430488700E-01   4.122226343122E-02
1.571172128200E-01   4.146690161622E-02
1.620904653000E-01   4.172941346882E-02
1.670627065000E-01   4.201042788659E-02
1.720338266000E-01   4.231061767963E-02
1.770037051000E-01   4.263070107794E-02
1.819722098000E-01   4.297144332992E-02
1.869391948000E-01   4.333365839290E-02
1.919045001000E-01   4.371821071632E-02
1.968679449300E-01   4.412601711813E-02
2.018293481000E-01   4.455804875429E-02
2.067884827000E-01   4.501533318099E-02
2.117451174000E-01   4.549895650837E-02
2.166989929000E-01   4.601006564417E-02
2.216498230000E-01   4.654987062441E-02
2.748519982637E-01   5.265245077141E-02
2.798120632667E-01   5.311250424637E-02
2.847841342767E-01   5.341646762494E-02
2.897633302767E-01   5.356299787115E-02
2.947446678767E-01   5.355144540384E-02
2.997231321767E-01   5.338186148911E-02
3.046937506767E-01   5.305499765542E-02
3.096516659767E-01   5.257229714801E-02
3.145922069767E-01   5.193587866447E-02
3.195109559767E-01   5.114851282847E-02
3.244038112767E-01   5.021359205471E-02
3.292670444767E-01   4.913509462773E-02
3.726442517933E-01   3.797661049494E-02
4.042787703933E-01   3.053730891325E-02
4.362048674933E-01   2.447016010757E-02
4.683630548933E-01   1.978646908995E-02
5.006934117933E-01   1.649496305418E-02
5.466032720809E-01   1.293365051385E-02
5.515649089211E-01   1.250453899044E-02
5.565220743518E-01   1.202652887131E-02
5.614743541456E-01   1.150030512438E-02
5.664213400367E-01   1.092643936003E-02
5.713626245966E-01   1.030539132855E-02
5.762977973641E-01   9.637510080129E-03
5.812264404573E-01   8.923035047547E-03
5.861481240638E-01   8.162096987126E-03
5.910624028952E-01   7.354718611205E-03
5.959688112333E-01   6.500815268762E-03
6.008668593363E-01   5.600195257586E-03
6.057560286351E-01   4.652560157990E-03
6.106357620727E-01   3.657504968866E-03
6.155054854990E-01   2.614518052382E-03
6.194588126644E-01   1.730349848801E-03
6.722290744087E-01 -1.030097121099E-02
6.770843889434E-01 -1.141535964174E-02
6.819387526984E-01 -1.253388273987E-02
6.867924580614E-01 -1.365526005078E-02
6.916458017116E-01 -1.477820183576E-02
6.964990829695E-01 -1.590141331209E-02
7.013526014917E-01 -1.702359880966E-02
7.062066554199E-01 -1.814346599874E-02
7.110615391362E-01 -1.925973004834E-02
7.159175413182E-01 -2.037111780721E-02
7.207749430983E-01 -2.147637196527E-02
7.256340160322E-01 -2.257425513817E-02
7.839769107523E-01 -3.557479166984E-02
8.158405336002E-01 -4.197169985756E-02
8.478319011208E-01 -4.769562330845E-02
8.799368014657E-01 -5.274401921257E-02
9.325304552861E-01 -6.004756381453E-02
9.362838545281E-01 -6.059214805551E-02
9.412012713059E-01 -6.137994281743E-02
9.461050408970E-01 -6.224866233497E-02
9.509941141594E-01 -6.319661361536E-02
9.558674767525E-01 -6.422228495034E-02
9.607241366880E-01 -6.532434274915E-02
9.655631124875E-01 -6.650162833486E-02
9.703834214443E-01 -6.775315460962E-02
9.751840686812E-01 -6.907810285184E-02
9.799640366121E-01 -7.047581956230E-02
9.847222742252E-01 -7.194581320797E-02
9.894576868535E-01 -7.348775108621E-02
9.941691258545E-01 -7.510145614102E-02
9.988553782945E-01 -7.678690376019E-02
1.003515156455E+00 -7.854421848604E-02
1.053176690797E+00 -9.810297079373E-02
1.057819885235E+00 -9.990757457140E-02
1.062475316865E+00 -1.016803686076E-01
1.067143153955E+00 -1.034202346360E-01
1.071823500801E+00 -1.051261610338E-01
1.076516399269E+00 -1.067972473677E-01
1.081221831113E+00 -1.084327086099E-01
1.085939719588E+00 -1.100318791755E-01
1.090669933123E+00 -1.115942157192E-01
1.095412288002E+00 -1.131193008781E-01
1.100166551874E+00 -1.146068453583E-01
1.104932447707E+00 -1.160566901243E-01

1.309301222474E+00 -1.762807310863E-01

14 MeV, B_{Sep}=-4.2 kG

3.061515884556E-18   9.950000000000E-02
1.293209840000E-02   7.816198910089E-02
3.015610870000E-02   6.010974973132E-02
5.086369340000E-02   4.619048904951E-02
7.408302740000E-02   3.705744996043E-02
9.872440760000E-02   3.313925386302E-02
1.511490176800E-01   3.113406727709E-02
1.561252869900E-01   3.093678545373E-02
1.611012532000E-01   3.073200323304E-02
1.660768840000E-01   3.051922750303E-02
1.710521437000E-01   3.029794600746E-02
1.760269930000E-01   3.006762613209E-02
1.810013889000E-01   2.982771364537E-02
1.859752838000E-01   2.957763139098E-02
1.909486253000E-01   2.931677792968E-02
1.959213558000E-01   2.904452612812E-02
2.008934116000E-01   2.876022169180E-02
2.058647226000E-01   2.846318163986E-02
2.108352117000E-01   2.815269271901E-02
2.158047935000E-01   2.782800975424E-02
2.207733743000E-01   2.748835393374E-02
2.738618404767E-01   2.367193306468E-02
2.788284803867E-01   2.328699133716E-02
2.837906431967E-01   2.284807786622E-02
2.887478914767E-01   2.235674411005E-02
2.936998552767E-01   2.181472184341E-02
2.986462375767E-01   2.122391559608E-02
3.035868177767E-01   2.058639451550E-02
3.085214550767E-01   1.990438373164E-02
3.134500895767E-01   1.918025530163E-02
3.183727437767E-01   1.841651880969E-02
3.232895214767E-01   1.761581169358E-02
3.282006063767E-01   1.678088936398E-02
3.326442517767E-01   1.599749744302E-02
3.983176605933E-01   4.734814603467E-03
4.305974417933E-01   9.840294037274E-04
4.630185780933E-01 -1.234661402729E-03
4.955083927933E-01 -1.916284300224E-03
5.434384380088E-01 -1.327367175081E-03
5.484185540419E-01 -1.321381050113E-03
5.533980772262E-01 -1.398606898032E-03
5.583756685539E-01 -1.557417921919E-03
5.633500587724E-01 -1.796362290541E-03
5.683200358094E-01 -2.114162075867E-03
5.732844310815E-01 -2.509711760860E-03
5.782421080674E-01 -2.982076893786E-03
5.831919502095E-01 -3.530492501466E-03
5.881328499168E-01 -4.154361572303E-03
5.930636970834E-01 -4.853253403042E-03
5.979833690955E-01 -5.626902130184E-03
6.028907191615E-01 -6.475204982972E-03
6.077845662275E-01 -7.398220754790E-03
6.126636842033E-01 -8.396168146543E-03
6.175267906014E-01 -9.469423984530E-03
6.695499393593E-01 -2.141119502191E-02
6.744132129526E-01 -2.249027593440E-02
6.792838897610E-01 -2.353542984443E-02
6.841619473589E-01 -2.454557199371E-02
6.890473167328E-01 -2.551973502387E-02
6.939398846852E-01 -2.645707308815E-02
6.988394962000E-01 -2.735686548309E-02
7.037459579885E-01 -2.821851995919E-02
7.086590419147E-01 -2.904157549301E-02
7.135784884995E-01 -2.982570453276E-02
7.185040109020E-01 -3.057071476367E-02
7.234352996762E-01 -3.127665042846E-02
7.769834530435E-01 -3.863460803014E-02
8.091805959584E-01 -4.306111794769E-02
8.413772917991E-01 -4.749087849207E-02
8.735735400704E-01 -5.192388959298E-02
8.929017326591E-01 -5.458671379221E-02
9.352988290901E-01 -6.044446200216E-02
9.402188453881E-01 -6.121585246916E-02
9.451254297468E-01 -6.206852834847E-02
9.500175242930E-01 -6.300075994981E-02
9.548941088980E-01 -6.401099960724E-02
9.597541880433E-01 -6.509787835453E-02
9.645967791312E-01 -6.626020280767E-02
9.694209004506E-01 -6.749695176756E-02
9.742255606123E-01 -6.880727315272E-02
9.790097472423E-01 -7.019048062111E-02
9.837724169320E-01 -7.164605052726E-02
9.885124846247E-01 -7.317361867312E-02
9.932288131987E-01 -7.477297709826E-02
9.979202034385E-01 -7.644407096967E-02
1.002585383345E+00 -7.818699524014E-02
1.052249501038E+00 -9.773833847633E-02
1.056890273892E+00 -9.954916094758E-02
1.061543242599E+00 -1.013284097358E-01
1.066208588202E+00 -1.030749457673E-01
1.070886427780E+00 -1.047877357475E-01
1.075576815527E+00 -1.064658566531E-01
1.080279744931E+00 -1.081085000944E-01
1.084995150952E+00 -1.097149761794E-01
1.089722912517E+00 -1.112847169542E-01
1.094462856226E+00 -1.128172796715E-01
1.099214759058E+00 -1.143123491946E-01
1.103978352681E+00 -1.157697403210E-01
1.309301222480E+00 -1.762807310644E-01

12 MeV, B_{Sep}=-3.5 kG

3.061515884556E-18   9.950000000000E-02
1.285668000000E-02   7.811272301527E-02
2.988647970000E-02   5.987277343598E-02
5.034223840000E-02   4.558040571545E-02
7.332648580000E-02   3.586267920313E-02
9.783081750000E-02   3.114594671780E-02
1.511443138200E-01   2.754674418214E-02
1.561119449400E-01   2.719348405154E-02
1.610781780000E-01   2.682108956066E-02
1.660428572000E-01   2.642852722132E-02
1.710058094000E-01   2.601470860552E-02
1.759668423000E-01   2.557848755754E-02
1.809257422000E-01   2.511865728869E-02
1.858822714000E-01   2.463394735417E-02
1.908361662000E-01   2.412302051242E-02
1.957871333000E-01   2.358446946849E-02
2.007348471000E-01   2.301681350437E-02
2.056789458000E-01   2.241849500110E-02
2.106190275000E-01   2.178787585919E-02
2.155546459000E-01   2.112233382689E-02
2.204853051000E-01   2.042275874835E-02
2.738618404767E-01   1.235264910877E-02
2.787859159167E-01   1.159806477109E-02
2.837075016867E-01   1.082740389341E-02
2.886270289767E-01   1.004370593463E-02
2.935449614767E-01   9.250057915771E-03
2.984617876767E-01   8.449583026343E-03
3.033780137767E-01   7.645429204825E-03
3.082941552767E-01   6.840757703930E-03
3.132107287767E-01   6.038731648588E-03
3.181282447767E-01   5.242504592944E-03
3.230471975767E-01   4.455209082480E-03
3.279680605767E-01   3.679945228500E-03
3.326442517767E-01   2.957495637608E-03
3.984207931933E-01 -6.541990363396E-03
4.308041332933E-01 -9.248775203622E-03
4.632848977933E-01 -1.025244018285E-02
4.957735767933E-01 -9.550219435773E-03
5.426013442811E-01 -6.825852742125E-03
5.475768113499E-01 -6.611732115113E-03
5.525558303755E-01 -6.509085078556E-03
5.575359071538E-01 -6.515602456040E-03
5.625146953010E-01 -6.629222593715E-03
5.674899689711E-01 -6.848132483857E-03
5.724595965941E-01 -7.170767885721E-03
5.774215162891E-01 -7.595812740551E-03
5.823737119869E-01 -8.122197896209E-03
5.873141902466E-01 -8.749099264274E-03
5.922409582435E-01 -9.475935575223E-03
5.971520014393E-01 -1.030236556926E-02
6.020452621125E-01 -1.122828483402E-02
6.069186169728E-01 -1.225382202518E-02
6.117698560342E-01 -1.337933477423E-02
6.165966592969E-01 -1.460540470959E-02
6.684805879548E-01 -2.844560183642E-02
6.733120584050E-01 -2.965904643474E-02
6.781599099157E-01 -3.080528789788E-02
6.830235623406E-01 -3.188250752393E-02
6.879023071699E-01 -3.288916035748E-02
6.927953217999E-01 -3.382398579347E-02
6.977016835999E-01 -3.468601647822E-02
7.026203863890E-01 -3.547458578856E-02
7.075503573706E-01 -3.618933351595E-02
7.124904746574E-01 -3.683020971912E-02
7.174395852760E-01 -3.739747671022E-02
7.223965231594E-01 -3.789170911207E-02
7.763452802956E-01 -4.272453366787E-02
8.086927760872E-01 -4.586818896873E-02
8.410110712764E-01 -4.929905645982E-02
8.732976156304E-01 -5.301686540563E-02
8.927790165394E-01 -5.540088204938E-02
9.352059613716E-01 -6.072641340968E-02
9.401329373220E-01 -6.145187859455E-02
9.450449705166E-01 -6.227246014527E-02
9.499405653791E-01 -6.318602538386E-02
9.548182836485E-01 -6.419068346346E-02
9.596767239962E-01 -6.528478105074E-02
9.645145030839E-01 -6.646689791828E-02
9.693302373112E-01 -6.773584233367E-02
9.741225258978E-01 -6.909064653671E-02
9.788899330804E-01 -7.053056169018E-02
9.836309720883E-01 -7.205505317294E-02
9.883440888826E-01 -7.366379562095E-02
9.930276450842E-01 -7.535666754542E-02
9.976799019096E-01 -7.713374607578E-02
1.002299003404E+00 -7.899530126610E-02
1.051536268098E+00 -1.000505828780E-01
1.056125278469E+00 -1.019888116320E-01
1.060733300472E+00 -1.038813930804E-01
1.065360544721E+00 -1.057264750924E-01
1.070007095205E+00 -1.075223794985E-01
1.074672913080E+00 -1.092676117014E-01
1.079357842042E+00 -1.109608698015E-01
1.084061614403E+00 -1.126010528729E-01
1.088783858491E+00 -1.141872685098E-01
1.093524106972E+00 -1.157188394490E-01
1.098281806089E+00 -1.171953092215E-01
1.103056325183E+00 -1.186164465932E-01
1.106978535326E+00 -1.197390869292E-01
1.309205805809E+00 -1.765900643155E-01

12 MeV, B_{Sep}=-3.1 kG

```
3.061515884556E-18  9.950000000000E-02        1.241328190000E-02  7.783334446886E-02
1.260428980000E-02  7.795157299308E-02        2.827231270000E-02  5.854540334785E-02
2.897353410000E-02  5.910347839786E-02        4.713119470000E-02  4.217848253796E-02
4.854388230000E-02  4.360495261803E-02        6.845968570000E-02  2.919275960195E-02
7.064121940000E-02  3.198985370959E-02        9.165810710000E-02  1.995334526537E-02
9.450438640000E-02  2.465827224962E-02        1.500980765000E-01  5.572163934125E-03
1.501279210500E-01  1.535517181305E-02        1.549214889700E-01  4.332941533346E-03
1.550336684000E-01  1.449750917943E-02        1.597235978000E-01  3.013346976082E-03
1.599296942000E-01  1.358599893112E-02        1.645019569000E-01  1.610204691280E-03
1.648149121000E-01  1.261824862295E-02        1.692539388000E-01  1.201943654567E-04
1.696881183000E-01  1.159173587347E-02        1.739766421000E-01 -1.460143461107E-03
1.745479788000E-01  1.050380597951E-02        1.786668644000E-01 -3.134399782979E-03
1.793930158000E-01  9.351669942672E-03        1.833210723000E-01 -4.906287117025E-03
1.842215923000E-01  8.132403030125E-03        1.879353698000E-01 -6.779626647342E-03
1.890318955000E-01  6.842944012919E-03        1.925054645000E-01 -8.758332025372E-03
1.938219181000E-01  5.480095250044E-03        1.970266307000E-01 -1.084638925651E-02
1.985894390000E-01  4.040523814417E-03        2.014936712000E-01 -1.304783203311E-02
2.033320008000E-01  2.520763889201E-03        2.059001765000E-01 -1.536671179820E-02
2.080468867000E-01  9.172206993927E-04        2.102419824000E-01 -1.780706174613E-02
2.127310938000E-01 -7.738237151306E-04        2.145101260000E-01 -2.037285388757E-02
2.173813061000E-01 -2.556202532528E-03        2.186978007000E-01 -2.306794822999E-02
2.219938638000E-01 -4.433853583592E-03        2.227968107000E-01 -2.589603305552E-02
2.756966900767E-01 -2.750585559589E-02        2.754857553667E-01 -6.423307800215E-02
2.803212726267E-01 -2.935719793682E-02        2.796585308767E-01 -6.695278621031E-02
2.849984010767E-01 -3.107141141157E-02        2.839857117767E-01 -6.941933488151E-02
2.897261658767E-01 -3.264052928653E-02        2.884562994767E-01 -7.161517848099E-02
2.945018486767E-01 -3.405706931131E-02        2.930567408767E-01 -7.352394559120E-02
2.993219547767E-01 -3.531411462512E-02        2.977710860767E-01 -7.513081373656E-02
3.041822594767E-01 -3.640539376404E-02        3.025812164767E-01 -7.642286820874E-02
3.090778699767E-01 -3.732535748875E-02        3.074671420767E-01 -7.738942293333E-02
3.140032998767E-01 -3.806925012903E-02        3.124073608767E-01 -7.802233315166E-02
3.189525572767E-01 -3.863317321553E-02        3.173792713767E-01 -7.831615196113E-02
3.239192427767E-01 -3.901413934150E-02        3.223596238767E-01 -7.826834382145E-02
3.288966576767E-01 -3.921011446618E-02        3.273249947767E-01 -7.787932322138E-02
3.726442517933E-01 -3.893727827717E-02        3.322522685767E-01 -7.715245000297E-02
4.051312176933E-01 -3.808670563834E-02        3.917963160933E-01 -6.589211367451E-02
4.375635176933E-01 -3.601974067344E-02        4.236607719933E-01 -5.949714704974E-02
4.698956230933E-01 -3.273928500428E-02        4.554522600933E-01 -5.274878189077E-02
5.020821457933E-01 -2.824994376052E-02        4.871668607933E-01 -4.564785014667E-02
5.412485710150E-01 -2.202356889015E-02        5.375451890145E-01 -3.383002365322E-02
5.461867164911E-01 -2.137943972035E-02        5.424133279158E-01 -3.278100322419E-02
5.511423251567E-01 -2.088728254161E-02        5.473172754471E-01 -3.191459443680E-02
5.561104847960E-01 -2.054414161759E-02        5.522495713400E-01 -3.122760801597E-02
5.610656958466E-01 -2.034730750909E-02        5.572032471415E-01 -3.071702174025E-02
5.660663224199E-01 -2.029433098075E-02        5.621717603871E-01 -3.038001560699E-02
5.710455455307E-01 -2.038303331794E-02        5.671489297560E-01 -3.021399961782E-02
5.760203185228E-01 -2.061151355258E-02        5.721288728809E-01 -3.021663528107E-02
5.809868236288E-01 -2.097815285561E-02        5.771059461150E-01 -3.038585145332E-02
5.859413309011E-01 -2.148161662016E-02        5.820746855795E-01 -3.071985502980E-02
5.908801571015E-01 -2.212085413393E-02        5.870297501137E-01 -3.121713707343E-02
5.957996265983E-01 -2.289509633948E-02        5.919658661669E-01 -3.187647477201E-02
6.006960322755E-01 -2.380385150138E-02        5.968777723209E-01 -3.269692914729E-02
6.055655971384E-01 -2.484689893503E-02        6.017601662841E-01 -3.367783910764E-02
6.104044355312E-01 -2.602428061747E-02        6.066076514827E-01 -3.481881146620E-02
6.150831606434E-01 -2.730020446395E-02        6.114146842452E-01 -3.611970702236E-02
6.673885692392E-01 -4.229624348164E-02        6.629448145381E-01 -5.184992089281E-02
6.722175511285E-01 -4.351919287236E-02        6.677406918125E-01 -5.319649457578E-02
6.770755628320E-01 -4.462117231498E-02        6.725785698209E-01 -5.438332939947E-02
6.819598617122E-01 -4.560006713780E-02        6.774535022966E-01 -5.540735765800E-02
6.868674947643E-01 -4.645431108828E-02        6.823602102539E-01 -5.626630740301E-02
6.917953485962E-01 -4.718290457220E-02        6.872931725571E-01 -5.695873521330E-02
6.967402009254E-01 -4.778542752075E-02        6.922467202258E-01 -5.748404838786E-02
7.016987742679E-01 -4.826204684958E-02        6.972151327572E-01 -5.784251604270E-02
7.066677892817E-01 -4.861351814511E-02        7.021927346279E-01 -5.803526894632E-02
7.116440177433E-01 -4.884118174480E-02        7.071739895336E-01 -5.806428820418E-02
7.166243329327E-01 -4.894695319349E-02        7.121535908590E-01 -5.793238338712E-02
7.216057580536E-01 -4.893330862056E-02        7.171265453456E-01 -5.764316077327E-02
7.818807279530E-01 -4.81969583404E-02        7.616042936921E-01 -5.345270294158E-02
8.143707083851E-01 -4.893444008208E-02        7.940259506005E-01 -5.125594765419E-02
8.468152958421E-01 -5.080312663305E-02        8.265190309298E-01 -5.081864640904E-02
8.791751422123E-01 -5.380039169604E-02        8.589880934009E-01 -5.214208327670E-02
9.324822082686E-01 -6.036766186028E-02        8.913377968281E-01 -5.522237213512E-02
9.361924777423E-01 -6.086378654944E-02        9.332313363989E-01 -6.046338431915E-02
9.411165882209E-01 -6.16084535739E-02        9.381638539365E-01 -6.115015091610E-02
9.460254512494E-01 -6.244779845860E-02        9.430820475095E-01 -6.193295548771E-02
9.509175843726E-01 -6.337972586491E-02        9.479843931067E-01 -6.280956762272E-02
9.555915583700E-01 -6.440239660378E-02        9.528694318628E-01 -6.377800018713E-02
9.606459768961E-01 -6.551420429036E-02        9.577357499494E-01 -6.483650534413E-02
9.654794579940E-01 -6.671377476853E-02        9.625819591274E-01 -6.598357018873E-02
9.702906160550E-01 -6.799996149392E-02        9.674066780700E-01 -6.721791215965E-02
9.750780445332E-01 -6.937184084247E-02        9.722085148367E-01 -6.853847444886E-02
9.798402989197E-01 -7.082870725641E-02        9.769860497134E-01 -6.994442124508E-02
9.845758803471E-01 -7.237006838543E-02        9.817378184010E-01 -7.143513286234E-02
9.892832190508E-01 -7.399564000788E-02        9.864622956397E-01 -7.301020081528E-02
9.939606579765E-01 -7.570534082274E-02        9.911578786904E-01 -7.466942267759E-02
9.986064362494E-01 -7.749928700824E-02        9.958228710588E-01 -7.641279683668E-02
1.003218672421E+00 -7.937778648265E-02        1.000455465603E+00 -7.824051685582E-02
1.052452563674E+00 -1.004417859310E-01        1.005053727721E+00 -8.015296560788E-02
1.057045353350E+00 -1.023710414086E-01        1.054287409069E+00 -1.012188884678E-01
1.061657207050E+00 -1.042542657165E-01        1.058887793926E+00 -1.031299604994E-01
1.066288309775E+00 -1.060896407077E-01        1.063507332154E+00 -1.049942536214E-01
1.070938720683E+00 -1.078755242003E-01        1.068146158056E+00 -1.068100189195E-01
1.075608376974E+00 -1.096104594289E-01        1.072804281236E+00 -1.085756872035E-01
1.080297099476E+00 -1.112931840293E-01        1.077481591867E+00 -1.102898785081E-01
1.085004599124E+00 -1.129226382174E-01        1.082177865787E+00 -1.119514105044E-01
1.089730484333E+00 -1.144979720905E-01        1.086892772062E+00 -1.135593065586E-01
1.094474269868E+00 -1.160185521707E-01        1.091625880590E+00 -1.151128026249E-01
1.099235385677E+00 -1.174839666752E-01        1.096376671108E+00 -1.166113533312E-01
1.104013187152E+00 -1.188940299248E-01        1.101144542369E+00 -1.180546368362E-01
1.309205805809E+00 -1.765900643161E-01        1.105928822736E+00 -1.194425588184E-01
                                               1.309205805810E+00 -1.765900643117E-01
```

12 MeV, B_{Sep}=-2.8 kG

```
3.061515884556E-18  9.950000000000E-02
```

10 MeV, B_{Sep}=-2.9 kG

```
3.061515884556E-18   9.950000000000E-02        1.245019280000E-02   7.785594148378E-02
1.263944680000E-02   7.797367748954E-02        2.840832550000E-02   5.865150008332E-02
2.910150260000E-02   5.920831323140E-02        4.740709030000E-02   4.244904644921E-02
4.879875730000E-02   4.387350540451E-02        6.889013960000E-02   2.972304293111E-02
7.102836060000E-02   3.251644079694E-02        9.222837720000E-02   2.084614972405E-02
9.499710080000E-02   2.554236972385E-02        1.501043884000E-01   7.499723373199E-03
1.501321074400E-01   1.709813304343E-02        1.549430986100E-01   6.321426563967E-03
1.550483308000E-01   1.630273979947E-02        1.597591087000E-01   5.053560682595E-03
1.599547597000E-01   1.544902417305E-02        1.645496071000E-01   3.692497873341E-03
1.648501803000E-01   1.453430985533E-02        1.693114636000E-01   2.234413507810E-03
1.697332358000E-01   1.355574958712E-02        1.740411936000E-01   6.752943912576E-04
1.746024095000E-01   1.251032173611E-02        1.787349189000E-01  -9.890499317611E-04
1.794560063000E-01   1.139482741242E-02        1.833883249000E-01  -2.762972114309E-03
1.842921313000E-01   1.020588831417E-02        1.879966149000E-01  -4.650967425302E-03
1.891086670000E-01   8.939945531719E-03        1.925544602000E-01  -6.657648773316E-03
1.939032476000E-01   7.593259582360E-03        1.970559471000E-01  -8.787715334869E-03
1.986732310000E-01   6.161911997641E-03        2.014945205000E-01  -1.104591365121E-02
2.034156680000E-01   4.641808843560E-03        2.058629245000E-01  -1.343698991538E-02
2.081272679000E-01   3.028686620612E-03        2.101531405000E-01  -1.596563202571E-02
2.128043618000E-01   1.318121067050E-03        2.143563229000E-01  -1.863639983877E-02
2.174428618000E-01  -4.944605246440E-04        2.184627352000E-01  -2.145364192232E-02
2.220382175000E-01  -2.413762770664E-03        2.224616861000E-01  -2.442139999942E-02
2.756883856167E-01  -2.618555422349E-02        2.754385929767E-01  -6.649410449662E-02
2.802986236067E-01  -2.807219027111E-02        2.795262323265E-01  -6.933953369263E-02
2.849700960767E-01  -2.980158135803E-02        2.838108732467E-01  -7.187849846896E-02
2.897000209767E-01  -3.136396045696E-02        2.882749365767E-01  -7.408664694511E-02
2.944844980767E-01  -3.275024418061E-02        2.928968437767E-01  -7.594167617188E-02
2.993185658767E-01  -3.395215799034E-02        2.976513464767E-01  -7.742401937587E-02
3.041962836767E-01  -3.496235844003E-02        3.025100050767E-01  -7.851748357167E-02
3.091108373767E-01  -3.577454811094E-02        3.074418034767E-01  -7.920980101466E-02
3.140546675767E-01  -3.638357894232E-02        3.124138798767E-01  -7.949306098661E-02
3.190196166767E-01  -3.678553993646E-02        3.173923431767E-01  -7.936399452462E-02
3.239970928767E-01  -3.697782571472E-02        3.223431380767E-01  -7.882409350602E-02
3.289782453767E-01  -3.695918310379E-02        3.272329186767E-01  -7.787955619543E-02
3.726442517933E-01  -3.456498011093E-02        3.320298870767E-01  -7.654106287242E-02
4.050727632933E-01  -3.241873035540E-02        3.912024449933E-01  -5.697608628448E-02
4.374518287933E-01  -2.962393925112E-02        4.224046118933E-01  -4.788972024083E-02
4.697684794933E-01  -2.618172620923E-02        4.539119159933E-01  -3.992561007884E-02
5.020097717933E-01  -2.209346995591E-02        4.856840067933E-01  -3.309395522344E-02
5.420783043961E-01  -1.660247777579E-02        5.391040378731E-01  -2.348773237785E-02
5.470302131417E-01  -1.607476876905E-02        5.440236423678E-01  -2.271530056892E-02
5.519968419106E-01  -1.571064890908E-02        5.489688675949E-01  -2.212872519626E-02
5.569726376326E-01  -1.550685171997E-02        5.539323363436E-01  -2.172447078374E-02
5.619523964700E-01  -1.546044712776E-02        5.589071571641E-01  -2.149929249658E-02
5.669311974808E-01  -1.556885652930E-02        5.638868389602E-01  -2.145027106810E-02
5.719043389774E-01  -1.582986292640E-02        5.688652108120E-01  -2.157483471732E-02
5.768672768747E-01  -1.624163672047E-02        5.738363447894E-01  -2.187077413745E-02
5.818155666056E-01  -1.680263796030E-02        5.787944813139E-01  -2.233625125132E-02
5.867448051832E-01  -1.751181494294E-02        5.837339567839E-01  -2.296980233927E-02
5.916505755408E-01  -1.836839977170E-02        5.886491327032E-01  -2.377033589092E-02
5.965283917440E-01  -1.937200081362E-02        5.935343258749E-01  -2.473712540281E-02
6.013736433899E-01  -2.052257183013E-02        5.983837401382E-01  -2.586979730657E-02
6.061815412837E-01  -2.182039799895E-02        6.031913979758E-01  -2.716831371524E-02
6.109470621514E-01  -2.326607826440E-02        6.079510721264E-01  -2.863294977245E-02
6.154617545198E-01  -2.478839821490E-02        6.126562167672E-01  -3.026426512724E-02
6.672359501903E-01  -4.307576108551E-02        6.641995815795E-01  -4.998767787678E-02
6.719926399255E-01  -4.455492753094E-02        6.689077917898E-01  -5.161427034565E-02
6.767925391988E-01  -4.588718696875E-02        6.736741334375E-01  -5.306165145400E-02
6.816317915120E-01  -4.706850849189E-02        6.784926580539E-01  -5.432444641942E-02
6.865060910340E-01  -4.809566126072E-02        6.833567656020E-01  -5.539832779229E-02
6.914107690792E-01  -4.896626098736E-02        6.882593385709E-01  -5.628008988501E-02
6.963408891617E-01  -4.967880641597E-02        6.931928874794E-01  -5.696770602932E-02
7.012913453819E-01  -5.023270423098E-02        6.981497038544E-01  -5.746036665813E-02
7.062569642272E-01  -5.062828204924E-02        7.031220187405E-01  -5.775849727657E-02
7.112326070057E-01  -5.086678916021E-02        7.081021594694E-01  -5.786375552769E-02
7.162132684859E-01  -5.095038486564E-02        7.130827023803E-01  -5.777900801306E-02
7.211941724955E-01  -5.088211545886E-02        7.180566179996E-01  -5.750828822056E-02
7.816775157879E-01  -4.922710771863E-02        7.680645617857E-01  -5.299766084960E-02
8.141747720061E-01  -4.948907088323E-02        8.005101712786E-01  -5.117776519720E-02
8.466425296421E-01  -5.089797250895E-02        8.330061973346E-01  -5.098312806679E-02
8.790403220347E-01  -5.345205659806E-02        8.654712789635E-01  -5.241422395579E-02
9.326366738964E-01  -5.934284938090E-02        8.928556817219E-01  -5.489224179754E-02
9.365081760085E-01  -5.981285779572E-02        9.345531026610E-01  -5.956411187335E-02
9.414388298865E-01  -6.051271125857E-02        9.394684588644E-01  -6.021952063328E-02
9.463527672814E-01  -6.132166522037E-02        9.443893284126E-01  -6.098516591593E-02
9.512479878830E-01  -6.223711009869E-02        9.492292699950E-01  -6.185830667068E-02
9.561225716650E-01  -6.325676140423E-02        9.541753350982E-01  -6.283652897901E-02
9.609746471254E-01  -6.437865362896E-02        9.590366364773E-01  -6.391774050800E-02
9.658023627376E-01  -6.560113410832E-02        9.638743181763E-01  -6.510016428107E-02
9.706038582355E-01  -6.692285602843E-02        9.686865266388E-01  -6.638233195875E-02
9.753772379919E-01  -6.834277143455E-02        9.734713835856E-01  -6.776307692046E-02
9.801205443551E-01  -6.986012369374E-02        9.782269592856E-01  -6.924152691244E-02
9.848317322650E-01  -7.147443908424E-02        9.829512466419E-01  -7.081709645601E-02
9.895086428475E-01  -7.318552242362E-02        9.876421355007E-01  -7.248947887470E-02
9.941489780004E-01  -7.499344053453E-02        9.922973867059E-01  -7.425863778867E-02
9.987502738891E-01  -7.689852083910E-02        9.969146056256E-01  -7.612479794374E-02
1.003309873763E+00  -7.890133709783E-02        1.001491216230E+00  -7.808843561408E-02
1.052105175123E+00  -1.015558544133E-01        1.005543868720E+00  -7.987534275052E-02
1.056564144229E+00  -1.036145084703E-01        1.054823744079E+00  -1.027980616117E-01
1.061204351154E+00  -1.056133220252E-01        1.059375956857E+00  -1.048211633397E-01
1.065794212817E+00  -1.075494807844E-01        1.063955029455E+00  -1.067827051197E-01
1.070411034155E+00  -1.094204368447E-01        1.068561077994E+00  -1.086800301628E-01
1.075054622625E+00  -1.112239276154E-01        1.073193996203E+00  -1.105107595120E-01
1.079724578444E+00  -1.129579939177E-01        1.077853465793E+00  -1.122728105813E-01
1.084420308594E+00  -1.146209966674E-01        1.082538969200E+00  -1.139644143457E-01
1.089141042648E+00  -1.162116317263E-01        1.087249804654E+00  -1.155841309419E-01
1.093885851425E+00  -1.177289430521E-01        1.091985104440E+00  -1.171308637451E-01
1.098653667167E+00  -1.191723336051E-01        1.096743853530E+00  -1.186038700875E-01
1.103443304799E+00  -1.205415737873E-01        1.101524911190E+00  -1.200027749822E-01
1.309511285127E+00  -1.755997246898E-01        1.106327032620E+00  -1.213275698784E-01
                                                1.309511285127E+00  -1.755997246908E-01
```

10 MeV, B_{Sep}=-2.65 kG

```
3.061515884556E-18   9.950000000000E-02
```

10 MeV, B_{Sep}=-2.4 kG

```
3.061515884556E-18   9.950000000000E-02
1.282725110000E-02   7.809363486742E-02
2.978071360000E-02   5.978104496527E-02
5.013634530000E-02   4.534431757711E-02
7.302480540000E-02   3.540001109074E-02
9.746858210000E-02   3.037282325171E-02
1.511417123300E-01   2.613148280097E-02
1.561042840000E-01   2.571315033953E-02
1.610644445000E-01   2.526714447287E-02
1.660218977000E-01   2.479199947599E-02
1.709763119000E-01   2.428615645304E-02
1.759273149000E-01   2.374795888701E-02
1.808744896000E-01   2.317564800412E-02
1.858173682000E-01   2.256735796357E-02
1.907554262000E-01   2.192111088789E-02
1.956880756000E-01   2.123481175373E-02
2.006146574000E-01   2.050624316988E-02
2.055344327000E-01   1.973306007637E-02
2.104465736000E-01   1.891278440794E-02
2.153501522000E-01   1.804279977611E-02
2.202441290000E-01   1.712034623697E-02
2.738618404767E-01   6.244069705549E-03
2.787444346367E-01   5.256035699036E-03
2.836291402667E-01   4.278498165369E-03
2.885168322767E-01   3.316009714131E-03
2.934083299767E-01   2.373061041848E-03
2.983043818767E-01   1.454061882998E-03
3.032056516767E-01   5.633218731333E-04
3.081127055767E-01  -2.949686563959E-04
3.130260016767E-01  -1.116757910059E-03
3.179458810767E-01  -1.898151819533E-03
3.228725614767E-01  -2.635433102924E-03
3.278061324767E-01  -3.325080074770E-03
3.326442517767E-01  -3.951105287215E-03
3.985054543933E-01  -1.157826709304E-02
4.309508755933E-01  -1.339701459241E-02
4.634469555933E-01  -1.353111567708E-02
4.959062827933E-01  -1.198020962473E-02
5.424064727673E-01  -8.082531775424E-03
5.473760170837E-01  -7.759709292741E-03
5.523525566865E-01  -7.573391157076E-03
5.573323097518E-01  -7.520632713912E-03
5.623117336724E-01  -7.598825503113E-03
5.672874771417E-01  -7.805702215911E-03
5.722563341587E-01  -8.139339189013E-03
5.772152013496E-01  -8.598157081523E-03
5.821610360766E-01  -9.180919695004E-03
5.870908159853E-01  -9.886731291021E-03
5.920014997695E-01  -1.071503254716E-02
5.968899882479E-01  -1.166559511262E-02
6.017530852552E-01  -1.273851471051E-02
6.065874591466E-01  -1.393420285470E-02
6.113896028585E-01  -1.525337674273E-02
6.161557934444E-01  -1.669704725637E-02
6.677443787997E-01  -3.320685785651E-02
6.725215852488E-01  -3.461871085203E-02
6.773277905230E-01  -3.592843132736E-02
6.821614765489E-01  -3.713276187008E-02
6.870208247368E-01  -3.822895102899E-02
6.919037549120E-01  -3.921478158695E-02
6.968079675537E-01  -4.008859453196E-02
7.017309909243E-01  -4.084930849481E-02
7.066702294205E-01  -4.149643376556E-02
7.116230147554E-01  -4.203008094658E-02
7.165866569096E-01  -4.245096375495E-02
7.215584947338E-01  -4.276039609043E-02
7.759140336688E-01  -4.529651655677E-02
8.083541885597E-01  -4.726191364772E-02
8.407578413975E-01  -4.975785323064E-02
8.731163160799E-01  -5.278366702108E-02
8.928556834154E-01  -5.489223056207E-02
9.355202228586E-01  -5.968623200664E-02
9.404539706423E-01  -6.036392323865E-02
9.453714145253E-01  -6.115127637628E-02
9.502705341902E-01  -6.204561614985E-02
9.551493960916E-01  -6.304459350257E-02
9.600061216501E-01  -6.414617969800E-02
9.648388573609E-01  -6.534865995277E-02
9.696457469937E-01  -6.665062687227E-02
9.744249041731E-01  -6.805097333143E-02
9.791743856872E-01  -6.954888502865E-02
9.838921659823E-01  -7.114383292832E-02
9.885761110188E-01  -7.283556505921E-02
9.932239526392E-01  -7.462409801030E-02
9.978332624127E-01  -7.650970774761E-02
1.002401424126E+00  -7.849291939288E-02
1.051201088641E+00  -1.011372079908E-01
1.055732051088E+00  -1.032074703789E-01
1.060289615612E+00  -1.052184853548E-01
1.064874081366E+00  -1.071673877195E-01
1.069485519250E+00  -1.090515747032E-01
1.074123779834E+00  -1.108687252263E-01
1.078788503726E+00  -1.126168180395E-01
1.083479135217E+00  -1.142941487492E-01
1.088194937964E+00  -1.158993451215E-01
1.092935013121E+00  -1.174313805945E-01
1.097698318877E+00  -1.188895855419E-01
1.102483691754E+00  -1.202736562867E-01
1.106476247420E+00  -1.213674643275E-01
1.309511285128E+00  -1.755997246886E-01
```

D   Periodic focusing conditions on closed orbit right upstream of corner angle

Periodic conditions at cell end, for various energies.

```
20 MeV
Reference particle (#**), path length :   39.578474    cm relative momentum :    1.32266
       Beam  matrix  (beta/-alpha/-alpha/gamma) and  periodic  dispersion  (MKSA units)
         0.277058    -0.357720     0.000000     0.000000     0.000000     0.045019
        -0.357720     4.071225     0.000000     0.000000     0.000000    -0.108820
         0.000000     0.000000     0.722733     1.289590     0.000000     0.000000
         0.000000     0.000000     1.289590     3.684679     0.000000     0.000000

      Betatron  tunes : NU_X = 0.16030391        NU_Y = 0.12857045

18 MeV
Reference particle (#**), path length :   39.518172    cm relative momentum :    1.19360
       Beam  matrix  (beta/-alpha/-alpha/gamma) and  periodic  dispersion  (MKSA units)
         0.239062    -0.332904     0.000000     0.000000     0.000000     0.030863
        -0.332904     4.646591     0.000000     0.000000     0.000000    -0.103037
         0.000000     0.000000     0.658888     1.350336     0.000000     0.000000
         0.000000     0.000000     1.350336     4.285112     0.000000     0.000000

      Betatron  tunes : NU_X = 0.17711568        NU_Y = 0.15000260

16 MeV
Reference particle (#**), path length :   39.482634    cm relative momentum :    1.06454
       Beam  matrix  (beta/-alpha/-alpha/gamma) and  periodic  dispersion  (MKSA units)
         0.199818    -0.298959     0.000000     0.000000     0.000000     0.018133
        -0.298959     5.451854     0.000000     0.000000     0.000000    -0.096275
         0.000000     0.000000     0.604758     1.447936     0.000000     0.000000
         0.000000     0.000000     1.447936     5.120262     0.000000     0.000000

      Betatron  tunes : NU_X = 0.19912122        NU_Y = 0.17790106

15 MeV
Reference particle (#**), path length :   39.474945    cm relative momentum :    1.00000
       Beam  matrix  (beta/-alpha/-alpha/gamma) and  periodic  dispersion  (MKSA units)
         0.179605    -0.277058     0.000000     0.000000     0.000000     0.012372
        -0.277058     5.995156     0.000000     0.000000     0.000000    -0.092516
         0.000000     0.000000     0.583892     1.521455     0.000000     0.000000
         0.000000     0.000000     1.521455     5.677122     0.000000     0.000000

      Betatron  tunes : NU_X = 0.21292607        NU_Y = 0.19484922

14 MeV
Reference particle (#89), path length :   39.474427    cm relative momentum :   0.935457
       Beam  matrix  (beta/-alpha/-alpha/gamma) and  periodic  dispersion  (MKSA units)
         0.158876    -0.250488     0.000000     0.000000     0.000000     0.007053
        -0.250488     6.689143     0.000000     0.000000     0.000000    -0.088499
         0.000000     0.000000     0.568900     1.621564     0.000000     0.000000
         0.000000     0.000000     1.621564     6.379807     0.000000     0.000000

      Betatron  tunes : NU_X = 0.22934844        NU_Y = 0.21437553

12 MeV
Reference particle (#45), path length :   39.496347    cm relative momentum :   0.806353
       Beam  matrix  (beta/-alpha/-alpha/gamma) and  periodic  dispersion  (MKSA units)
         0.115029    -0.174578     0.000000     0.000000     0.000000    -0.002130
        -0.174578     8.958417     0.000000     0.000000     0.000000    -0.079682
         0.000000     0.000000     0.568616     1.974456     0.000000     0.000000
         0.000000     0.000000     1.974456     8.614738     0.000000     0.000000

      Betatron  tunes : NU_X = 0.27433821        NU_Y = 0.26473639

10 MeV
Reference particle (# 1), path length :   39.551412    cm relative momentum :   0.677214
       Beam  matrix  (beta/-alpha/-alpha/gamma) and  periodic  dispersion  (MKSA units)
         0.063314    -0.015390     0.000000     0.000000     0.000000    -0.009154
        -0.015390    15.798087     0.000000     0.000000     0.000000    -0.069814
         0.000000     0.000000     0.704221     3.074521     0.000000     0.000000
         0.000000     0.000000     3.074521    14.842907     0.000000     0.000000

      Betatron  tunes : NU_X = 0.35491793        NU_Y = 0.34664183
```

E   Zgoubi data files for computing ellipse conditions at septum entrance

20 MeV

```
Data generated using 'REVERSE'
'OBJET'                                                                          1
5.171103865922e+01
5.01
.001 .001 .001 .001 .001 .001
  6.973489E-01 2.156972E+01  0.0E+00  0.0E+00  0.0E+00  1.32265940E+00 'i'        20.000000 MeV
-0.357720  0.277058  1.289590 0.722733 0 1 0 0 0 0
    'PARTICUL'                                                                   2
    5.10998920e-01 1.602176487e-19 1.159652181100e-03 0.00e+00 0
```

```
      'FAISCEAU'                                                                                    3
'FAISTORE'                                                                                          4
b_zgoubi.fai   #E
 1
      'DRIFT' ld                                                                                    5
      4.
      'MARKER' dum  .plt                                                                            6
      'MULTIPOL' kicker2                                                                            7
      00 2   .plt
     13.  10.   -0.2329649441  0.  0. 0. 0. 0. 0. 0. 0. 0.
      0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
      0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
      0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
      #320|20|320
      2  0.00e+00  0.  0.00e+00
      'DRIFT' ld                                                                                    8
      4.
      'MULTIPOL' QF                                                                                 9
      00 2   .plt
      5.878241131662439  3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
      0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
      0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
      0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
      #320|59|320
      2  0.00e+00  0.7513707181808552  0.
      'DRIFT' sd                                                                                   10
      5.00e+00
      'MARKER' BPM2 off                                                                            11
      'MULTIPOL' QD                                                                                12
      00 2   .plt
      7.569871747666486  5.30e+00  0.  -2.49324632276342185  0. 0. 0. 0. 0. 0. 0. 0.
      0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
      0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
      0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
      #320|76|320
      2  0.00e+00  3.404834122312866 0.
      'CHANGREF'                                                                                   13
      0.00e+00 0.00e+00 -8.571428571429e+00
      'MARKER' BPM1 off                                                                            14
      'DRIFT' ld                                                                                   15
      4.
      'MARKER' dum  .plt                                                                           16
      'MULTIPOL' kicker1                                                                           17
      00 2   .plt
     13.  10.   -0.4177002755  0.  0. 0. 0. 0. 0. 0. 0. 0.
      0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
      0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
      0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
      #320|20|320
      2  0.00e+00  0.  0.00e+00
      'DRIFT' ld                                                                                   18
      4.
      'MULTIPOL' QF                                                                                19
      00 2   .plt
      5.878241131662439  3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
      0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
      0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
      0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
      #320|59|320
      2  0.00e+00  0.7513707181808552  0.
      'DRIFT' sd                                                                                   20
      5.00e+00
      'MARKER' BPM2 off                                                                            21
      'MULTIPOL' QD                                                                                22
      00 2   .plt
      7.569871747666486  5.30e+00  0.  -2.49324632276342185  0. 0. 0. 0. 0. 0. 0. 0.
      0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
      0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
      0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
      #320|76|320
      2  0.00e+00  3.404834122312866 0.
      'DRIFT'    dr .plt      ! distance to septum vessel opening                                  23
      2.7151711
      'DRIFT'    dr .plt      ! distance to septum exit                                            24
      2.1011412
      'MULTIPOL' septum                                                                            25
      00 2   .plt
     10.  10. -6.35  0.  0. 0. 0. 0. 0. 0. 0. 0.
      0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
      0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
      0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
      #320|20|320
      2  0.00e+00  5.  0.00e+00
'COLLIMA'                                                                                           26
 1
1.1  8.14  11.76 -999. 999.
      'FAISCEAU'                                                                                   27
      'CHANGREF'                                                                                   28
0.  9.95  65.
      'FAISCEAU'                                                                                   29
```

```
        'MARKER' #E                                                              30
'MATRIX'                                                                          31
 1 0
'END'                                                                            32
```

18 MeV

```
Data generated using 'REVERSE'
'OBJET'                                                                          1
5.171103865922e+01
5.01
.001 .001 .001 .001 .001 .0001
 3.100903E-01  1.068780E+01  0.0E+00  0.0E+00  0.0E+00  1.19360420E+00 'i'         18 MeV
-0.332904  0.239062  1.350336  0.658888  0 1   0.030863  0.103037  0 0
  'PARTICUL'                                                                      2
   5.10998920e-01 1.602176487e-19 1.159652181100e-03 0.00e+00 0
  'FAISCEAU'                                                                      3
'FAISTORE'                                                                        4
b_zgoubi.fai   #E
 1
  'DRIFT' ld                                                                      5
  4.
  'MARKER' dum  .plt                                                              6
  'MULTIPOL' kicker2                                                              7
  00 2   .plt
 13.  10.   -0.3119671283  0.  0.  0.  0.  0.  0.  0.  0.  0.
  0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
  4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
  0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
  4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
  0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
  #320|20|320
  2  0.00e+00  0.  0.00e+00
  'DRIFT' ld                                                                      8
  4.
  'MULTIPOL' QF                                                                   9
   00 2   .plt
  5.878241131662439  3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
  4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
  4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
  #320|59|320
  2  0.00e+00  0.7513707181808552  0.
  'DRIFT' sd                                                                     10
  5.00e+00
  'MARKER' BPM2 off                                                             11
  'MULTIPOL' QD                                                                 12
  00 2   .plt
  7.569871747666486  5.30e+00  0.  -2.49324632276342185  0. 0. 0. 0. 0. 0. 0. 0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
  4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
  4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
  #320|76|320
  2  0.00e+00  3.404834122312866  0.
  'CHANGREF'                                                                     13
  0.00e+00 0.00e+00 -8.571428571429e+00
  'MARKER' BPM1 off                                                             14
  'DRIFT' ld                                                                    15
  4.
  'MARKER' dum  .plt                                                            16
  'MULTIPOL' kicker1                                                            17
  00 2   .plt
 13.  10.   -0.4258981463  0.  0.  0.  0.  0.  0.  0.  0.  0.
  0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
  4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
  0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
  4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
  0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
  #320|20|320
  2  0.00e+00  0.  0.00e+00
  'DRIFT' ld                                                                    18
  4.
  'MULTIPOL' QF                                                                 19
  00 2   .plt
  5.878241131662439  3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
  4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
  4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
  #320|59|320
  2  0.00e+00  0.7513707181808552  0.
  'DRIFT' sd                                                                    20
  5.00e+00
  'MARKER' BPM2 off                                                             21
  'MULTIPOL' QD                                                                 22
  00 2   .plt
  7.569871747666486  5.30e+00  0.  -2.49324632276342185  0. 0. 0. 0. 0. 0. 0. 0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
  4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
  4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
  #320|76|320
  2  0.00e+00  3.404834122312866  0.
  'DRIFT'    dr .plt      ! distance to septum vessel opening                   23
  2.7151711
  'DRIFT'    dr .plt      ! distance to septum exit                            24
  2.1011412
```

```
   'MULTIPOL' septum                                                                    25
    00 2   .plt
   10.  10.  -5.8  0.   0. 0. 0. 0. 0. 0. 0. 0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0. 0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
    #320|20|320
    2 0.00e+00  5.  0.00e+00
   'COLLIMA'                                                                             26
    1
   1.1  8.14  11.76 -999. 999.
    'FAISCEAU'                                                                           27
    'CHANGREF'                                                                           28
   0.  9.95  64.99934
    'FAISCEAU'                                                                           29
    'MARKER' #E                                                                          30
    'MATRIX'                                                                             31
    1 0
   'END'                                                                                 32
```

16 MeV

To be documented

15 MeV

```
Data generated using 'REVERSE'
'OBJET'                                                                                 1
5.171103865922e+01
5.01
.001 .001 .001 .001 .001 .0001
 -6.239026E-02 -6.622761  0.0E+00  0.0E+00  0.0E+00  1.00000000E+00 'i'         15.000000 MeV
-0.277058  0.179605 1.521455 0.583892 0 1 0.012372 -0.092516 0 0
    'PARTICUL'                                                                           2
    5.10998920e-01 1.602176487e-19 1.159652181100e-03 0.00e+00 0
    'FAISCEAU'                                                                           3
   'FAISTORE'                                                                            4
  b_zgoubi.fai   #E
   1
    'DRIFT' ld                                                                           5
    4.
    'MARKER' dum  .plt                                                                   6
    'MULTIPOL' kicker2                                                                   7
    00 2   .plt
   13.  10.  -0.4002465829  0.  0. 0. 0. 0. 0. 0. 0. 0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0. 0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
    #320|20|320
    2 0.00e+00  0.  0.00e+00
    'DRIFT' ld                                                                           8
    4.
    'MULTIPOL' QF                                                                        9
    00 2   .plt
    5.878241131662439  3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0. 0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
    #320|59|320
    2 0.00e+00  0.7513707181808552  0.
    'DRIFT' sd                                                                          10
    5.00e+00
    'MARKER' BPM2 off                                                                   11
    'MULTIPOL' QD                                                                       12
    00 2   .plt
    7.569871747666486  5.30e+00  0. -2.49324632276342185  0. 0. 0. 0. 0. 0. 0. 0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0. 0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
    #320|76|320
    2 0.00e+00  3.404834122312866  0.
    'CHANGREF'                                                                          13
   0.00e+00 0.00e+00 -8.571428571429e+00
    'MARKER' BPM1 off                                                                   14
    'DRIFT' ld                                                                          15
    4.
    'MARKER' dum  .plt                                                                  16
    'MULTIPOL' kicker1                                                                  17
    00 2   .plt
   13.  10.  -0.5431651166  0.  0. 0. 0. 0. 0. 0. 0. 0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
    4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0. 0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
    #320|20|320
    2 0.00e+00  0.  0.00e+00
    'DRIFT' ld                                                                          18
    4.
    'MULTIPOL' QF                                                                       19
    00 2   .plt
    5.878241131662439  3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
```

```
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
    #320|59|320
   2  0.00e+00  0.7513707181808552  0.
    'DRIFT' sd                                                                        20
    5.00e+00
    'MARKER' BPM2 off                                                                 21
    'MULTIPOL' QD                                                                     22
    00 2   .plt
   7.569871747666486  5.30e+00  0. -2.49324632276342185  0. 0. 0. 0. 0. 0. 0. 0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
    #320|76|320
   2  0.00e+00  3.404834122312866  0.
    'DRIFT'    dr .plt       ! distance to septum vessel opening                      23
    2.7151711
    'DRIFT'    dr .plt       ! distance to septum exit                               24
    2.1011412
    'MULTIPOL' septum                                                                25
    00 2   .plt
  10.  10.  -5  0.  0. 0. 0. 0. 0. 0. 0. 0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
    #320|20|320
   2  0.00e+00  5.  0.00e+00
  'COLLIMA'                                                                           26
   1
  1.1  8.14  11.76 -999. 999.
    'FAISCEAU'                                                                        27
    'CHANGREF'                                                                        28
   0.  9.95  64.99934
    'FAISCEAU'                                                                        29
    'MARKER' #E                                                                       30
    'MATRIX'                                                                          31
   1 0
  'END'                                                                               32
```

14 MeV

To be documented

12 MeV

```
Data generated using 'REVERSE'
'OBJET'                                                                               1
5.171103865922e+01
5.01
.001 .001 .001 .001 .001 .0001
-1.591154E-01  -2.514833E+01  0.0E+00  0.0E+00  0.0E+00  8.06353490E-01 'i'        12.000000 MeV
-0.174578   0.115029  1.974456   0.568616   0 1  -0.002130  -0.079682  0 0
    'PARTICUL'                                                                        2
    5.10998920e-01 1.602176487e-19 1.159652181100e-03 0.00e+00 0
    'FAISCEAU'                                                                        3
  'FAISTORE'                                                                          4
  b_zgoubi.fai   #E
   1
    'DRIFT' ld                                                                        5
    4.
    'MARKER' dum  .plt                                                                6
    'MULTIPOL' kicker2                                                                7
    00 2   .plt
  13.  10.  0.4468260810  0.  0. 0. 0. 0. 0. 0. 0. 0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
    #320|20|320
   2  0.00e+00  0.  0.00e+00
    'DRIFT' ld                                                                        8
    4.
    'MULTIPOL' QF                                                                     9
    00 2   .plt
   5.878241131662439  3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
    #320|59|320
   2  0.00e+00  0.7513707181808552  0.
    'DRIFT' sd                                                                       10
    5.00e+00
    'MARKER' BPM2 off                                                                11
    'MULTIPOL' QD                                                                    12
    00 2   .plt
   7.569871747666486  5.30e+00  0. -2.49324632276342185  0. 0. 0. 0. 0. 0. 0. 0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
    0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
    #320|76|320
```

```
  2  0.00e+00  3.404834122312866 0.
   'CHANGREF'                                                                     13
  0.00e+00 0.00e+00 -8.571428571429e+00
   'MARKER' BPM1 off                                                              14
   'DRIFT' ld                                                                     15
   4.
   'MARKER' dum  .plt                                                             16
   'MULTIPOL' kicker1                                                             17
   00 2   .plt
  13.  10.   -0.4807337595  0.  0. 0. 0. 0. 0. 0. 0. 0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
   #320|20|320
  2  0.00e+00  0.  0.00e+00
   'DRIFT' ld                                                                     18
   4.
   'MULTIPOL' QF                                                                  19
   00 2   .plt
  5.878241131662439 3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
   #320|59|320
  2  0.00e+00  0.7513707181808552 0.
   'DRIFT' sd                                                                     20
  5.00e+00
   'MARKER' BPM2 off                                                              21
   'MULTIPOL' QD                                                                  22
   00 2   .plt
  7.569871747666486  5.30e+00  0. -2.49324632276342185  0. 0. 0. 0. 0. 0. 0. 0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
   #320|76|320
  2  0.00e+00  3.404834122312866 0.
   'DRIFT'    dr .plt       ! distance to septum vessel opening                   23
  2.7151711
   'DRIFT'    dr .plt       ! distance to septum exit                            24
  2.1011412
   'MULTIPOL' septum                                                             25
   00 2   .plt
  10.  10. -3.1  0.  0. 0. 0. 0. 0. 0. 0. 0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
   #320|20|320
  2  0.00e+00  5.  0.00e+00
   'COLLIMA'                                                                      26
   1
  1.1  8.14  11.76 -999. 999.
   'FAISCEAU'                                                                     27
   'CHANGREF'                                                                     28
  0.  9.95  64.99934
   'FAISCEAU'                                                                     29
   'MARKER' #E                                                                    30
   'MATRIX'                                                                       31
   1 0
 'END'                                                                           32
```

10 MeV

```
Data generated using 'REVERSE'
'OBJET'                                                                          1
5.171103865922e+01
5.01
.001 .001 .001 .001 .001 .001
 -5.547658E-02  -3.818484E+1  0.0E+00  0.0E+00  0.0E+00  6.77214420E-01 'i'        10.000000 MeV
-0.015390 0.063314  3.074521 0.704221  0 1 0 0 0 0
   'PARTICUL'                                                                     2
   5.10998920e-01 1.602176487e-19 1.159652181100e-03 0.00e+00 0
   'FAISCEAU'                                                                     3
 'FAISTORE'                                                                       4
 b_zgoubi.fai   #E
  1
   'DRIFT' ld                                                                     5
   4.
   'MARKER' dum  .plt                                                             6
   'MULTIPOL' kicker2                                                             7
   00 2   .plt
  13.  10.   0.3804271955  0.  0. 0. 0. 0. 0. 0. 0. 0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
   0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
   #320|20|320
  2  0.00e+00  0.  0.00e+00
   'DRIFT' ld                                                                     8
   4.
   'MULTIPOL' QF                                                                  9
   00 2   .plt
  5.878241131662439 3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
   0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
   4  .1455   2.2670  -.6395  1.1558  0. 0.  0.
```

```
     0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
     4 .1455   2.2670  -.6395  1.1558  0. 0.  0.
     0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
     #320|59|320
     2  0.00e+00  0.7513707181808552  0.
     'DRIFT' sd                                                                                       10
     5.00e+00
     'MARKER' BPM2 off                                                                                11
     'MULTIPOL' QD                                                                                    12
     00 2   .plt
     7.569871747666486  5.30e+00  0. -2.49324632276342185  0. 0. 0. 0. 0. 0. 0. 0.
      0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4 .1455   2.2670  -.6395  1.1558  0. 0.  0.
      0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4 .1455   2.2670  -.6395  1.1558  0. 0.  0.
      0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
     #320|76|320
     2  0.00e+00  3.404834122312866 0.
     'CHANGREF'                                                                                       13
     0.00e+00 0.00e+00 -8.571428571429e+00
     'MARKER' BPM1 off                                                                                14
     'DRIFT' ld                                                                                       15
     4.
     'MARKER' dum  .plt                                                                               16
     'MULTIPOL' kicker1                                                                               17
     00 2   .plt
     13.  10.  -0.2156519958  0.  0. 0. 0. 0. 0. 0. 0. 0.
      0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4 .1455   2.2670  -.6395  1.1558  0. 0.  0.
      0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4 .1455   2.2670  -.6395  1.1558  0. 0.  0.
      0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
     #320|20|320
     2  0.00e+00  0.  0.00e+00
     'DRIFT' ld                                                                                       18
     4.
     'MULTIPOL' QF                                                                                    19
      00 2   .plt
     5.878241131662439  3.70e+00  0.  2.47708182137912441  0. 0. 0. 0. 0. 0. 0. 0.
      0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4 .1455   2.2670  -.6395  1.1558  0. 0.  0.
      0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4 .1455   2.2670  -.6395  1.1558  0. 0.  0.
      0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
     #320|59|320
     2  0.00e+00  0.7513707181808552  0.
     'DRIFT' sd                                                                                       20
     5.00e+00
     'MARKER' BPM2 off                                                                                21
     'MULTIPOL' QD                                                                                    22
     00 2   .plt
     7.569871747666486  5.30e+00  0. -2.49324632276342185  0. 0. 0. 0. 0. 0. 0. 0.
      0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4 .1455   2.2670  -.6395  1.1558  0. 0.  0.
      0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4 .1455   2.2670  -.6395  1.1558  0. 0.  0.
      0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
     #320|76|320
     2  0.00e+00  3.404834122312866 0.
     'DRIFT'    dr .plt       ! distance to septum vessel opening                                     23
     2.7151711
     'DRIFT'    dr .plt       ! distance to septum exit                                               24
     2.1011412
     'MULTIPOL' septum                                                                                25
     00 2   .plt
     10.  10. -2.65  0.  0. 0. 0. 0. 0. 0. 0. 0.
      0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4 .1455   2.2670  -.6395  1.1558  0. 0.  0.
      0. 0.  1.00 1.00 1.00 1.00 1.00 1. 1. 1. 1.
      4 .1455   2.2670  -.6395  1.1558  0. 0.  0.
      0.  0.  0.  0.  0.  0.  0.00e+00  0.00e+00  0.00e+00  0.00e+00
     #320|20|320
     2  0.00e+00  5.  0.00e+00
 'COLLIMA'                                                                                            26
  1
 1.1  8.14  11.76 -999. 999.
     'FAISCEAU'                                                                                       27
     'CHANGREF'                                                                                       28
 0.  9.95  65.
     'FAISCEAU'                                                                                       29
     'MARKER' #E                                                                                      30
'MATRIX'                                                                                              31
 1 0
'END'                                                                                                32
```

References

[1] The ray-tracing code Zgoubi, Users' guide, http://sourceforge.net/index.php.