

OUTPUT FROM THE FOKKER-PLANCK CODE CQL3D.

FOR QUESTIONS CONTACT

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CQL3D IS A PRODUCT OF NERSC/GA/EPFL/CompX
COLLABORATION.

DATE/TIME is 2024/10/01 16:58 04.449s

MACHINE:

Linux node500 3.10.0–514.26.2.el7.x86_64 #1 SMP Tue Jul 4 15
:04:05 UTC 2017 x86_64 x86_64 x86_64 GNU

PWD:

/home/vandelijs/HFW_147634/scan_matrix_npar_beam_5_rf_0_7/npa
r_4

CQL3D VERSION: cql3d_git_210125.1

PGPLOT VERSION: v5.2.2

```

&setup0
ibox = 'box g35'
iuser = 'vandelij'
ioutput = 6
lrz = 65
noplots = 'enabled'
mnemonic = 'cql3d'
nlwritf = 'ncdfdist'
nlrestrt = 'disabled'
&end

&setup
acoefne = -1.8 -7.83 51.57 -353.68
acoefte = 8.01 -13.6 8.69 -114.59
bnumb(1) = 1.0
bnumb(2) = -1.0
bnumb(3) = 1.0
bnumb(4) = -1.0
bootst = 'disabled'
chang = 'noneg'
colmodl = 0
contrmin = 1e-12
dtr = 0.004 !0.001
dtr1(1) = 0.010,0.010 ! larger time step =dtr1 after nondtr
1=50
nondtr1(1)= 50,100
eegy(1,1,1,1) = 0.0
eegy(1,2,1,1) = 2.0
eegy(2,1,1,1) = 0.0
eegy(2,2,1,1) = 6.0
elecfld(0) = 0.0
elecfld(1) = 0.0
enloss(1) = 200.0
enmin = 10
enmax = 250
tandem = 'enabled'
enormi = 3250 !keV !If no losses, the tail can be large, u
se enorm=1e4
enorme = 300 ! 5000 TODO: changed this
eoved = 0.0
ephicc = 1.0
fds = 0.2
fmass(1) = 3.3435834581040974e-24
fmass(2) = 9.1095e-28
fmass(3) = 3.3435834581040974e-24
fmass(4) = 9.1095e-28
gamaset = 17
gsla = 270.0
gslb = 35.0

```

```

iactst = 'enabled'
idskf = 'disabled'
idskrf = 'disabled'
implct = 'enabled'
ineg = 'trunc_d' !'enabled' !This has large effect on results
iproelec = 'parabola'
iprone = 'spline'
iprote = 'spline'
iproti = 'spline'
iprozeff = 'parabola'
irzplt(1) = 5 !rho=0.18
irzplt(2) = 7 !rho=0.22
irzplt(3) = 8 !rho=0.23
irzplt(4) = 9 !rho=0.24
iy = 240 !254
izeff = 'ion'
jx = 500
kfrsou = 1
kpress(3) = 'enabled'
kspeci(1,1) = 'D'
kspeci(2,1) = 'general'
kspeci(1,2) = 'e'
kspeci(2,2) = 'general'
kspeci(1,3) = 'D'
kspeci(2,3) = 'maxwell'
kspeci(1,4) = 'e'
kspeci(2,4) = 'maxwell'
lbdry(1) = 'conscalm'
lbdry(2) = 'conscalm' ! TODO delete this
locquas = 'disabled'
lossmode(1)='simplban' !'disabled' !With losses, enorm can
be reduced
lz = 80
machine = 'toroidal'
manymat = 'disabled'
meshy = 'fixed_y'
mpwr = 0.1, 1.0, 1.0, 1.0,
mx = 3
nchec = 1
ncoef = 1
ncont = 20
nen = 120
netcdfnm = 'LH_CMOD.nc'
ngen = 2
njene = 51
nmax = 2
noffel = 10000
! nondtr1 = -1 !see above, near dtr1

```

```
nonel = 0
nplot = 100
nplt3d = 100 ! 30
npwr = 2.0 2.0 2.0 2.0
nrskip = 0
nrstrt = 1
nstop = 200
nstps = 100 ! for taunew="enabled" only
numby = 30
nv = 66
partner = 'bramb'
plt3d = 'enabled'
pltd = 'enabled'
pltdn = 'disabled'
pltend = 'enabled'
pltfvs = 'enabled'
pltinput = 'enabled'
pltmag = 1.0
pltsig = 'enabled'
pltpowe = 'last'
pltprpp = 'disabled'
pltrst = 'disabled'
pltstrm = 'disabled'
pltvecal = 'disabled'
pltvecc = 'disabled'
pltvece = 'disabled'
pltvecrf = 'disabled'
pltvflu = 'disabled'
pltvs = 'rho'
profpsi = 'disabled'
psimodel = 'spline'
qsineut = 'disabled'
radmaj = 177.7
radmin = 67
rd = 40.0
radcoord = "sqtorflx"
relativ = 'enabled'
rfacz = 1
rmirror = 7.5
rovera = 1e-06
roveram = 0.0
rya(1)= 0.01, 0.01693878, 0.02387755, 0.03081633, 0.0377551
, 0.04469388,
0.05163265, 0.05857143, 0.0655102, 0.07244898, 0.07938776
, 0.08632653,
0.09326531, 0.10020408, 0.10714286, 0.11408163, 0.12102041
, 0.12795918,
0.13489796, 0.14183673, 0.14877551, 0.15571429, 0.16265306
, 0.16959184,
```

```

0.17653061, 0.18346939, 0.19040816, 0.19734694, 0.20428571
, 0.21122449,
, 0.21816327, 0.22510204, 0.23204082, 0.23897959, 0.24591837
, 0.25285714,
, 0.25979592, 0.26673469, 0.27367347, 0.28061224, 0.28755102
, 0.2944898,
, 0.30142857, 0.30836735, 0.31530612, 0.3222449, 0.32918367
, 0.33612245,
, 0.34306122, 0.35, 0.351, 0.39664286, 0.44228571
, 0.48792857,
, 0.53357143, 0.57921429, 0.62485714, 0.6705, 0.71614286
, 0.76178571,
, 0.80742857, 0.85307143, 0.89871429, 0.94435714, 0.99
rzset = 'enabled'
! softxry = 'enabled'
syncrad = 'disabled'
tauloss(1,1) = 0.3
tauloss(2,1) = 0.0
tauloss(3,1) = 0.0
tbnd = 0.002
tfac = 1
tfacz = 1.0
thet1 = 105.73, 101.81, 97.78, 93.67, 89.52, 85.38, 81.28,
77.28, 73.39, 108.0,
104.08, 100.02, 95.86, 91.63, 87.39, 83.17, 79.03, 75.0
, 71.12, 106.35, 102.29,
98.1, 93.82, 89.5, 85.19, 80.92, 76.76, 72.74, 108.58,
104.55, 100.36, 96.06,
91.69, 87.3, 82.94, 78.66, 74.51, 70.51, 106.76, 102.61
, 98.32, 93.93, 89.49,
85.06, 80.69, 76.42, 72.3, 108.9, 104.8, 100.55, 96.17,
91.72, 87.25, 82.81,
78.46, 74.24, 70.19, 106.91, 102.72, 98.39, 93.96, 89.4
8, 85.01, 80.6, 76.3,
72.15,
thet2 = 133.8, 133.8, 133.8, 133.8, 133.8, 133.8, 133.8, 1
33.8, 133.8, 137.21,
137.21, 137.21, 137.21, 137.21, 137.21, 137.21, 137.21,
137.21, 137.21, 140.76,
140.76, 140.76, 140.76, 140.76, 140.76, 140.76, 140.76,
140.76, 144.43, 144.43,
144.43, 144.43, 144.43, 144.43, 144.43, 144.43, 144.43,
144.43, 148.2, 148.2,
148.2, 148.2, 148.2, 148.2, 148.2, 148.2, 148.2, 152.05
, 152.05, 152.05, 152.05,
152.05, 152.05, 152.05, 152.05, 152.05, 152.05, 155.92,
155.92, 155.92, 155.92,
155.92, 155.92, 155.92, 155.92, 155.92,
torloss(1) = 'disabled'
```

```

torloss(2) = 'disabled' ! TODO delete this
veclnth = 1.5
xfac = 0.5
xlwr = 0.085
xmdl = 0.25
xpctlwr = 0.1
xpctmdl = 0.4
ylower = 1.22
yreset = 'disabled'
yupper = 1.275
zmax = 408.0
x_sxr = 293.204
z_sxr = 0.0
! elecin(1) = -9.56741e-05, -0.000109526, -0.000147339, -0.
000198782,
!      -0.000251971, -0.000300431, -0.000342281, -0.000373012
!, -0.000387655,
!      -0.000385237, -0.000371319,
ryain = 0.0, 0.02, 0.04, 0.06, 0.08, 0.1, 0.12, 0.14, 0.16
, 0.18, 0.2, 0.22, 0.24,
      0.26, 0.28, 0.3, 0.32, 0.34, 0.36, 0.38, 0.4, 0.42, 0.4
4, 0.46, 0.48, 0.5, 0.52,
      0.54, 0.56, 0.58, 0.6, 0.62, 0.64, 0.66, 0.68, 0.7, 0.7
2, 0.74, 0.76, 0.78, 0.8,
      0.82, 0.84, 0.86, 0.88, 0.9, 0.92, 0.94, 0.96, 0.98, 1.
0,
enein(1,1) = 6000000000000.0, 59962941237520.016, 5986725
0566342.87,
      59703838452127.08, 59485184853022.37, 59205556569110.03
,
      58872591209671.39, 58485106557533.81, 58045531370610.30
5,
      57558573577903.8, 57020188242888.29, 56438639988791.0,
55813573292710.45,
      55146955340815.76, 54444837877610.28, 53709946180354.79
,
      52945027091694.945, 52158112415694.79, 51354626109057.1
95,
      50540946881032.766, 49723710007237.66, 48910511576005.1
2,
      48108497631514.016, 47324015547571.586, 46564296560072.
016,
      45836417796426.48, 45144012723240.39, 44491164589062.91
,
      43883204016679.27, 43323551556545.4, 42812289319189.98,
42352151810909.12, 41951558842993.96, 41609572556377.09
,
      41331550550812.77, 41126059334256.52, 41004351836888.71
,

```

40967930525976.56, 41001246650804.64, 41077805833778.76
6,
41164545982618.14, 41219666259056.3, 41189628109070.07,
40990780018190.04, 40529881759768.45, 39635090395688.4,
38087958508710.875, 35530224262919.92, 31393189052966.0
08,
25174433055907.145, 16795637554512.268,
enein(1,2) = 6000000000000.0, 59962941237520.016, 5986725
0566342.87,
59703838452127.08, 59485184853022.37, 59205556569110.03
,

58872591209671.39, 58485106557533.81, 58045531370610.30
5,
57558573577903.8, 57020188242888.29, 56438639988791.0,
55813573292710.45,
55146955340815.76, 54444837877610.28, 53709946180354.79
,

52945027091694.945, 52158112415694.79, 51354626109057.1
95,
50540946881032.766, 49723710007237.66, 48910511576005.1
2,
48108497631514.016, 47324015547571.586, 46564296560072.
016,
45836417796426.48, 45144012723240.39, 44491164589062.91
,

43883204016679.27, 43323551556545.4, 42812289319189.98,
42352151810909.12, 41951558842993.96, 41609572556377.09
,

41331550550812.77, 41126059334256.52, 41004351836888.71
,

40967930525976.56, 41001246650804.64, 41077805833778.76
6,
41164545982618.14, 41219666259056.3, 41189628109070.07,
40990780018190.04, 40529881759768.45, 39635090395688.4,
38087958508710.875, 35530224262919.92, 31393189052966.0
08,
25174433055907.145, 16795637554512.268,
enein(1,3) = 6000000000000.0, 59962941237520.016, 5986725
0566342.87,
59703838452127.08, 59485184853022.37, 59205556569110.03
,

58872591209671.39, 58485106557533.81, 58045531370610.30
5,
57558573577903.8, 57020188242888.29, 56438639988791.0,
55813573292710.45,
55146955340815.76, 54444837877610.28, 53709946180354.79
,

52945027091694.945, 52158112415694.79, 51354626109057.1
95,

50540946881032.766, 49723710007237.66, 48910511576005.1
2,
48108497631514.016, 47324015547571.586, 46564296560072.
016,
45836417796426.48, 45144012723240.39, 44491164589062.91
,

43883204016679.27, 43323551556545.4, 42812289319189.98,
42352151810909.12, 41951558842993.96, 41609572556377.09
,

41331550550812.77, 41126059334256.52, 41004351836888.71
,

40967930525976.56, 41001246650804.64, 41077805833778.76
6,
41164545982618.14, 41219666259056.3, 41189628109070.07,
40990780018190.04, 40529881759768.45, 39635090395688.4,
38087958508710.875, 35530224262919.92, 31393189052966.0
08,
25174433055907.145, 16795637554512.268,
tein = 4.44281005859, 4.43925062899, 4.43002880823, 4.4141
9954312,
4.39292066798, 4.3655572702, 4.33279584511, 4.294439552
91, 4.25064522772,
4.20181505414, 4.14740314882, 4.08818854875, 4.02400142
493, 3.95489433261,
3.88140403111, 3.80366320563, 3.72173074365, 3.63636384
601, 3.54797468075,
3.45708375922, 3.36412018512, 3.26984807583, 3.17490203
484, 3.07984626437,
2.98529582683, 2.89187263966, 2.7999924582, 2.710029026
34, 2.62236602787,
2.53721538174, 2.45456813656, 2.37451393386, 2.29738309
543, 2.22305211367,
2.1517115285, 2.08369714598, 2.01948207746, 1.959393847
29, 1.90409475533,
1.85436201111, 1.80979032805, 1.76817574884, 1.72655828
205, 1.68062782074,
1.62505517035, 1.55074463971, 1.44555848629, 1.28791463
034, 1.03491702324,
0.616721839132, 0.109689237026,
tescal = 1.0
tiscal = 1.0
tiin = 5.92374674, 5.91900084, 5.90670508, 5.88559939, 5.8
5722756, 5.82074303,
5.77706113, 5.7259194, 5.66752697, 5.60242007, 5.529870
86, 5.45091806,
5.36533523, 5.27319244, 5.17520537, 5.07155094, 4.96230
766, 4.84848513,
4.73063291, 4.60944501, 4.48549358, 4.35979743, 4.23320
271, 4.10646168,

```
    3.98039443, 3.85583019, 3.73332328, 3.61337203, 3.49648
804, 3.38295384,
    3.27275751, 3.16601858, 3.06317746, 2.96406948, 2.86894
87, 2.77826286,
    2.69264277, 2.61252513, 2.53879301, 2.47248268, 2.41305
377, 2.35756766,
    2.30207771, 2.24083709, 2.16674023, 2.06765952, 1.92741
131, 1.71721951,
    1.37988936, 0.82229579, 0.14625232,
zeffin(1) = 1.426, 1.426, 1.4265, 1.4275, 1.429, 1.431, 1.
433, 1.4355, 1.438,
    1.441, 1.4445, 1.448, 1.452, 1.4565, 1.461, 1.4655, 1.4
71, 1.4765, 1.482, 1.488,
    1.4945, 1.501, 1.507, 1.5135, 1.52, 1.5255, 1.5305, 1.5
355, 1.5395, 1.542,
    1.5435, 1.544, 1.543, 1.5395, 1.534, 1.526, 1.5155, 1.5
035, 1.491, 1.479,
    1.4675, 1.4555, 1.4425, 1.43, 1.418, 1.407, 1.398, 1.39
15, 1.3885, 1.389, 1.391,
```

```
sigmamod = 'enabled'
isigmas = 0,0,1,1,0,0
mmsv = 4
```

&end

```
&trsetup
adimeth = 'disabled'
difusr = 400.0
difus_rshape(1) = 1.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0,
difus_vshape(1) = 1.0, 0.0, 0.0, 3.0,
nontran = 11
pinch = 'case3n'
relaxden = 0.001
relaxtsp = 'disabled'
transp = 'disabled'
advectr = 1.0
&end
```

```
&sousetup
asor(1,1,1) = 0.0
asor(1,2,1) = 0.0
noffso(1,1) = 10000
noffso(1,2) = 10000
nonso(1,1) = 0
nonso(1,2) = 0
nso = 1
nsou = 10000
```

```

pltso = 'enabled'
scm2(1,1) = 0.001
scm2(1,2) = 10000.0
sellm1(1,1) = 1.0
sellm1(1,2) = 1.0
sellm2(1,1) = 1.0
sellm2(1,2) = 1.0
sem1(1,1) = 1600.0
sem1(1,2) = 0.0
sem2(1,1) = 0.5
sem2(1,2) = 25.0
seppm1(1,1) = 1.0
seppm1(1,2) = 1.0
seppm2(1,1) = 1.0
seppm2(1,2) = 1.0
soucoord = 'disabled'
sthm1(1,1) = 5.0
sthm1(1,2) = 0.0
szm1(1,1) = 0.0
szm1(1,2) = 0.0
szm2(1,1) = 100000.0
szm2(1,2) = 100000.0
knockon = 'disabled'
komodel = 'th'
flemodel = 'th_pol'
jfl = 150
nkorfn = 0
nonko = 0
noffko = 10000
soffvte = 4.5
isoucof = 1
faccnof = 0.5
xlfac = 0.1
xllwr = 0.085
xlmdl = 0.25
xlpctlwr = 0.1
xlpctmdl = 0.4
&end

```

```

&eqsetup
atol = 1e-08
bsign = 1
ellptcty = 0.0
eqmod = 'enabled'
eqpower = 2
eqsource = 'eqdsk'
eqdskin = "eqdsk"
fpsimodl = 'constant'
methflag = 10

```

```

nconeq = 'disabled'
nconeqn = 50
rbox = 92.0
rboxdst = 120.0
rmag = 166.0
rtol = 1e-08
zbox = 92.0
&end

&rfsetup
rdcmod='disabled'
call_lh='disabled',
call_ech='disabled',
call_fw='disabled',
lh='disabled',
ech='disabled',
fw='disabled',
! iurfl(1)='enabled', !'disabled' !so no double applicatio
n of linear damping
! iurfl(1)='disabled','enabled' !so no double application
of linear damping
iurfl(1)='disabled','disabled',
iurfcoll(1)='damp_out','damp_out'!'disabled','disabled' !
nharms=5,1 ! alphas,e !Choose appropriately to cover the pl
asma cross-section
nharm1= 5,0 ! alphas,e ! range: nharm1(i) to nharm1(i)+(nh
arms(i)-1)
nrfitr1=1000,
nrfitr2=0,
nrfitr3=1,
nrfpwr=0,
nrfstep1(1)=1000,
nrfstep1(2)=1000,
nrfstep2=000,
nondamp=0
noffrf(1)=100000, 100000
nonrf(1)=0, 0
nrf=0

nrfspecies(1)=1,2      !----- alphas,e

pwrscal(1)= 1.0 1.0 ! 1.0 1.0 TODO switch back to 1!one wa
ve type: FW, so - one value needed?
rfread='netcdf'
rffile(1)='genray.nc'
    'genray.nc'

rftype(1)='fw' 'fw'      !----- for alphas and e
nbssltbl=200000

```

```

nurftime=0
pwrsscale1(1)=0.0,0.10,0.30,1.00,
urftime(1)= 0.0,0.05,0.10,0.15, !sec
!!! pwrsscale1(1)=0.0,0.0,0.15433,0.37111,.64866,1.0,1.0
!!! urftime(1)=0.0,0.2,0.205,0.210,0.215,0.220,0.225
scaleurf='enabled',
urfdmp='firstd',
urfmod='enabled', !-----
urfrstrt='disabled',
urfwrray='disabled',
vlfmod='disabled',
vlhmod='disabled',
vparmax=.7956,
vparmin=.1768,
vprprop='disabled'
&end

&frsetup
aheigh(1,1) = 47.8
aheigh(1,2) = 47.8
aheigh(2,1) = 48.0
aheigh(2,2) = 48.0
alen(1,1) = 186.1
alen(1,2) = 186.1
alen(2,1) = 346.0
alen(2,2) = 346.0
alen(3,1) = 449.0
alen(3,2) = 449.0
alen(4,1) = 500.0
alen(4,2) = 500.0
angleh(1) = 19.5
angleh(2) = 19.5
anglev(1) = 0.0
anglev(2) = 0.0
ashape(1,1) = 's-rect'
ashape(1,2) = 's-rect'
ashape(2,1) = 's-rect'
ashape(2,2) = 's-rect'
ashape(3,1) = 'b-d3d'
ashape(3,2) = 'b-d3d'
ashape(4,1) = 'b-circ'
ashape(4,2) = 'b-circ'
awidth(1,1) = 13.8
awidth(1,2) = 13.8
awidth(2,1) = 17.7
awidth(2,2) = 17.7
awidth(4,1) = 50.9
awidth(4,2) = 50.9
bhdiv(1) = 0.5

```

bhdiv(2) = 0.5
bheigh(1) = 48.0
bheigh(2) = 10.0
bhofset(1) = 42.074
bhofset(2) = 42.074
bleni(1) = 556.808
bleni(2) = 556.808
blenp(1) = 539.0
blenp(2) = 539.0
bmsprd = 0.1
bptor(1) = 5000000 !5000000
bptor(2) = 0.d0 !5000000
bcur(2) = 0
bshape(1) = 'rect-lps'
bshape(2) = 'rect-lps'
bvdiv(1) = 1.3
bvdiv(2) = 1.3
bvfoc(1) = 1000.0
bvfoc(2) = 1000.0
bvofset(1) = 0.0
bvofset(2) = 0.0
bwidth(1) = 12.0
bwidth(2) = 12.0
ebkev(1) = 80
ebkev(2) = 80
fbcur(1,1) = 0.75
fbcur(1,2) = 0.75
fbcur(2,1) = 0.15
fbcur(2,2) = 0.15
fbcur(3,1) = 0.1
fbcur(3,2) = 0.1
frmod = 'enabled'
frplt = 'enabled'
ibcur = 1
iborb = 0
iexcit = 0
inubpat = 0
multiply = 'disabled'
naptr = 4
nbeams = 1
nfrplt = 400
nimp = 0
npart = 30000 !10000
nprim = 1 !2
npskip = 1
nsourc = 1 !2
rpivot(1) = 286.6
rpivot(2) = 286.6
sfrac1(1) = 0.0

```
sfrac1(2) = 0.0
smooth = 0.125
zpivot(1) = 0.0
zpivot{2} = 0.0
&end
```

PARAMETER VALUES

```
=====> version = cql3d_git_210125.1
=====> precursr = cql3d_git_201207.0
ngena is the max. # of general (time advanced) species
=====> ngena = 4
nmaxa is the max. # of background Maxwellian species
=====> nmaxa = 8
```

lza is the maximum number of z mesh points
=====> lza = 128

lrza is the maximum number of radial flux surfaces
=====> lrza = 128
analytic source routine parameters
nsoa is the number of sources per species.
=====> nsoa = 3

nplota is max number of plot times for 2d and 3d plots.
=====> nplota = 10
nbctimea is max number of points in arrays giving time
dependent profile information.
=====> nbctimea = 101
ndtr1a is maximum number of time step intervals dtr1().
=====> ndtr1a = 10
nefitera is the max number of iterations permitted for
electric field per time step (to obtain target current).
=====> nefitera = 10

nmodsa is max number of wave modes or harmonics for
a single mode. CHECK code, for values .ne. 3.
=====> nmodsa = 155

PARAMETER VALUES

EQUILIBRIUM model parameters:

nnra,nnza give the Maximum size the eqdsk
=====>NNRA = 257 =====>NNZA = 257
=====>NCONTEQA = 129

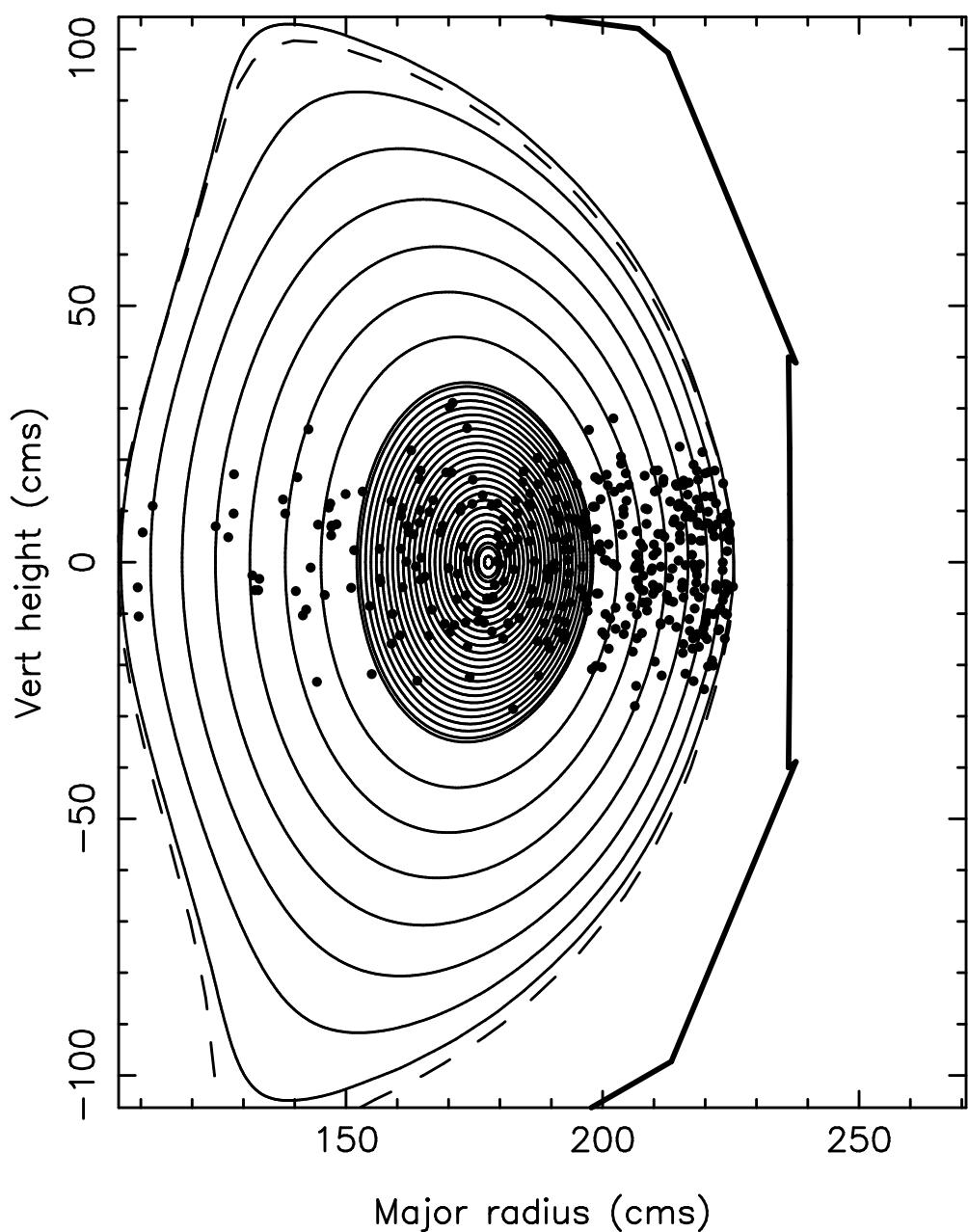
Urf (lower hybrid, fast wave, ech, ebw...) parameters:

=====>NMODSA = 155

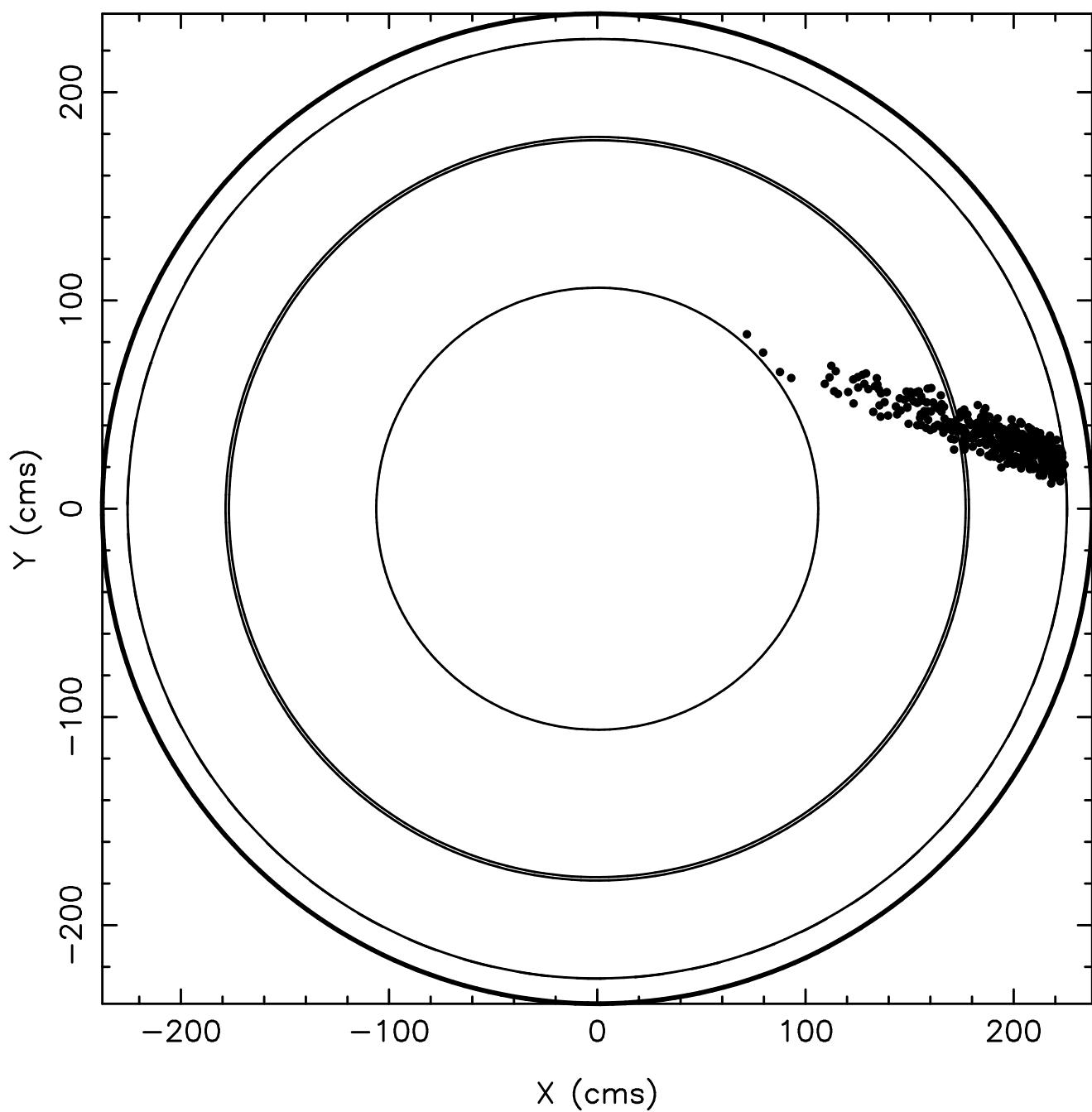
FR (freya beam deposition) model parameters:

npart is the number of ions launched
=====>npart = 30000

NBI Deposition

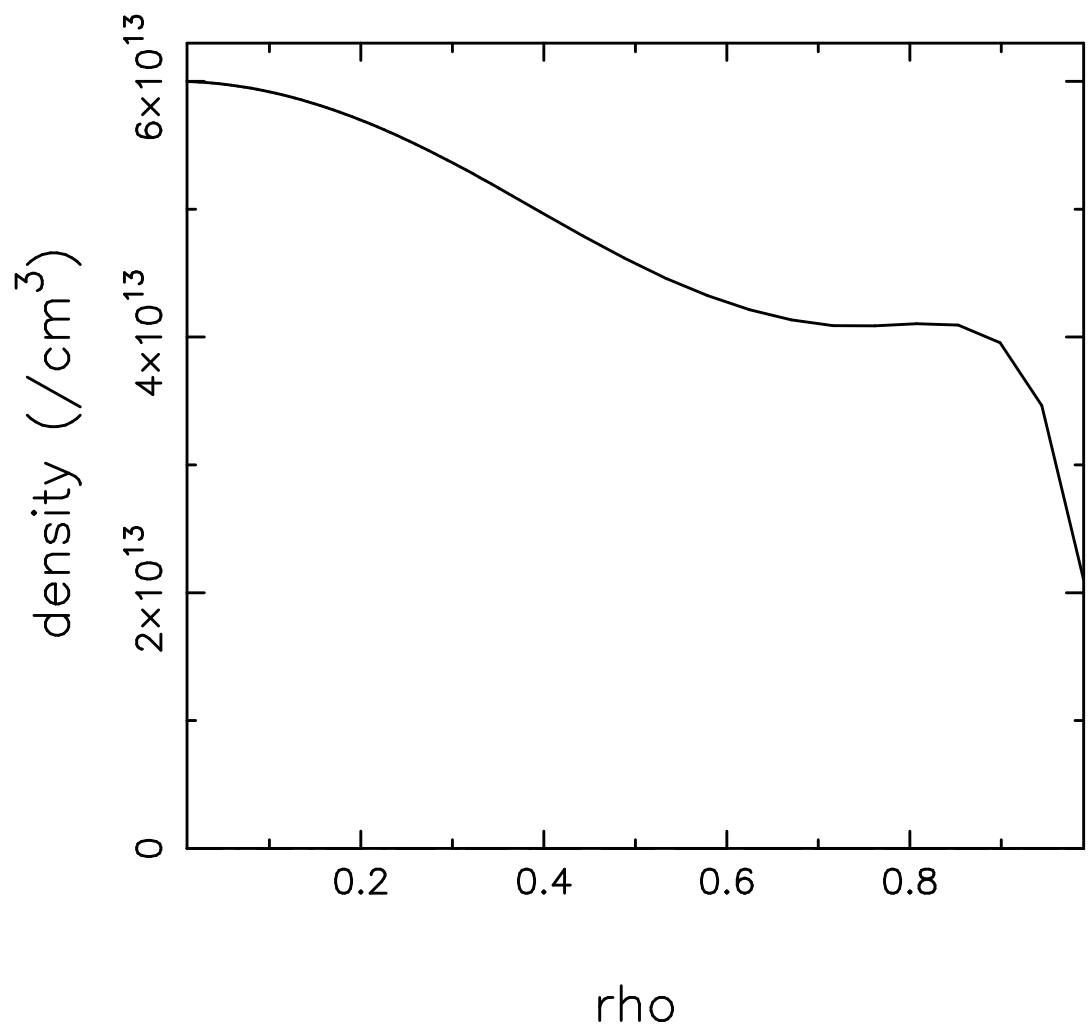


NBI Deposition



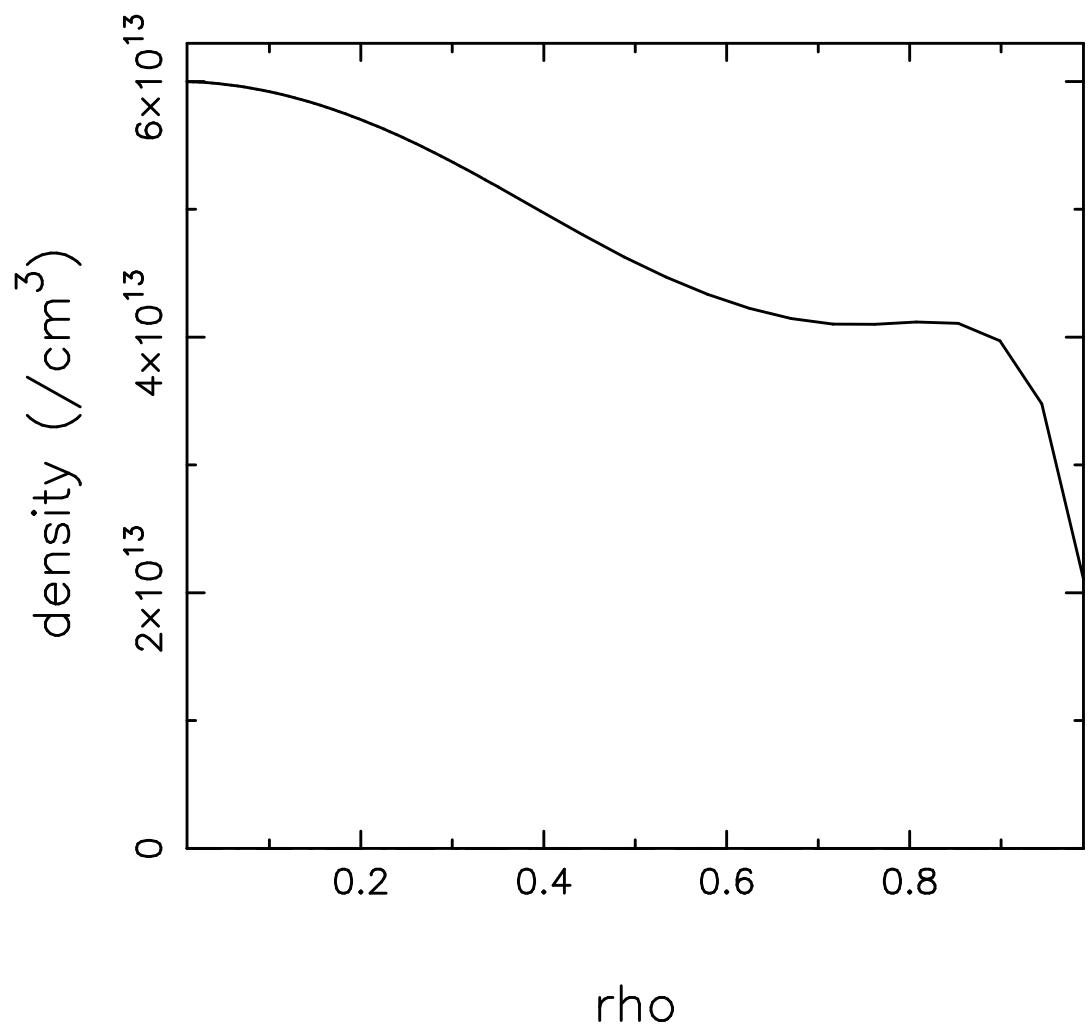
DENSITIES (/CC) OF SPECIES

species no. 1 D general time step n= 0



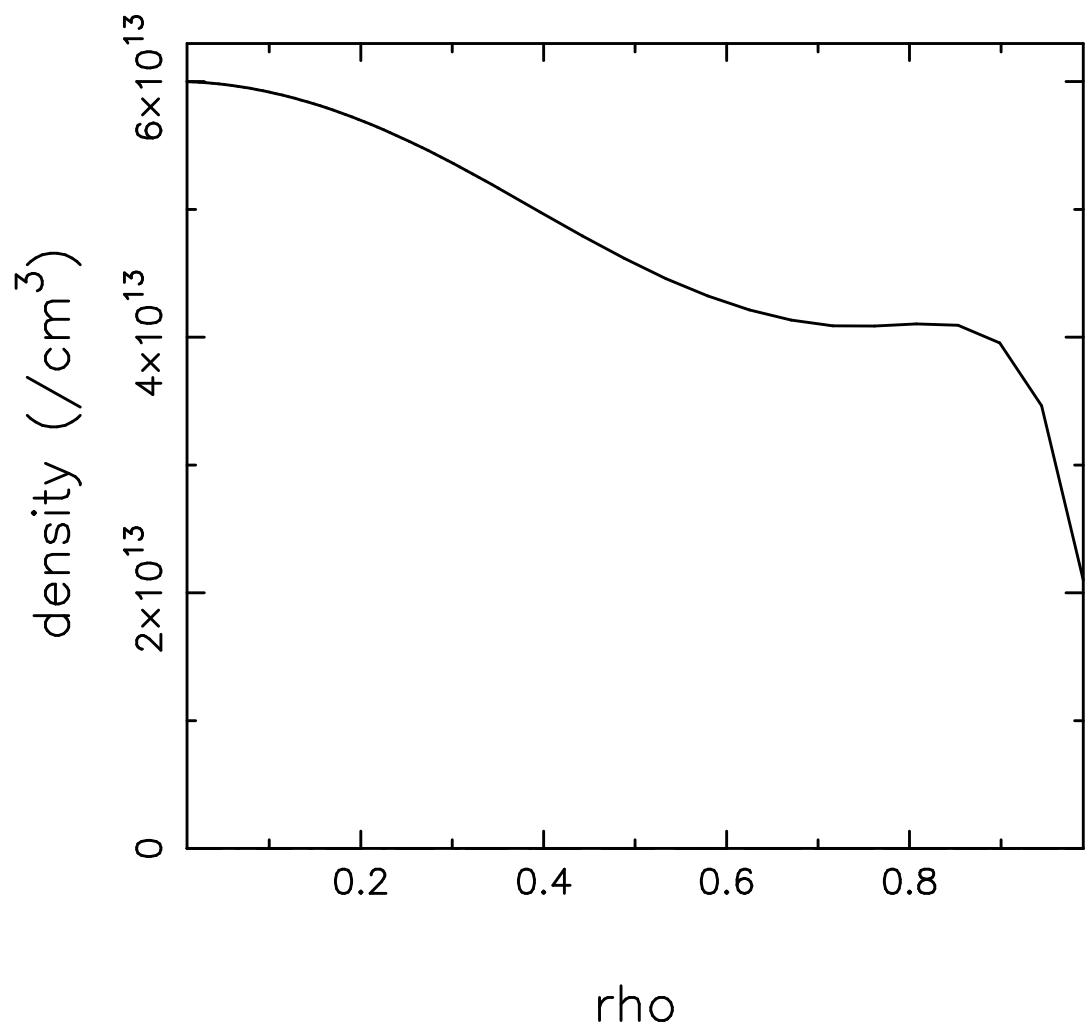
DENSITIES (/CC) OF SPECIES

species no. 2 e general time step n= 0



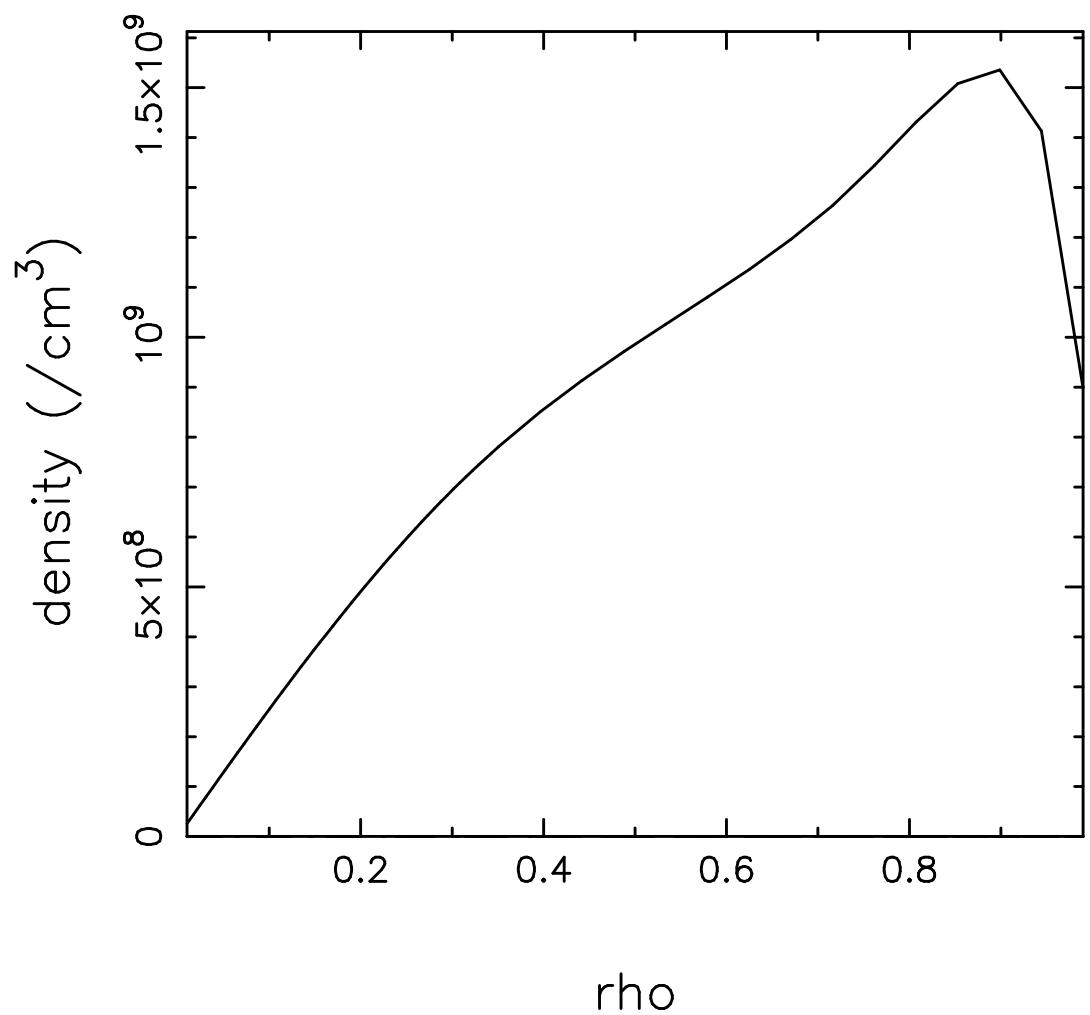
DENSITIES (/CC) OF SPECIES

species no. 3 D maxwell time step n= 0



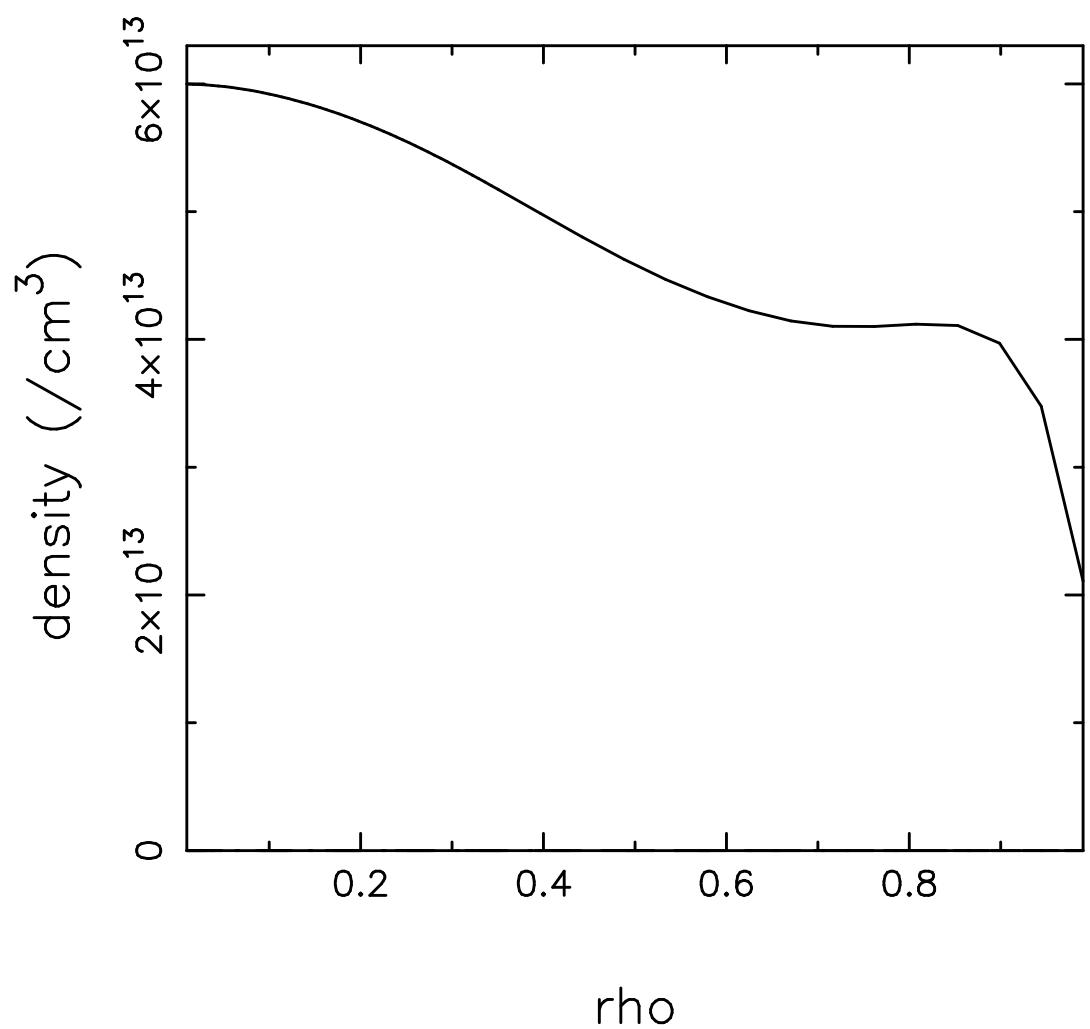
DENSITIES (/CC) OF SPECIES

species no. 4 impurity maxwell time step n= 0



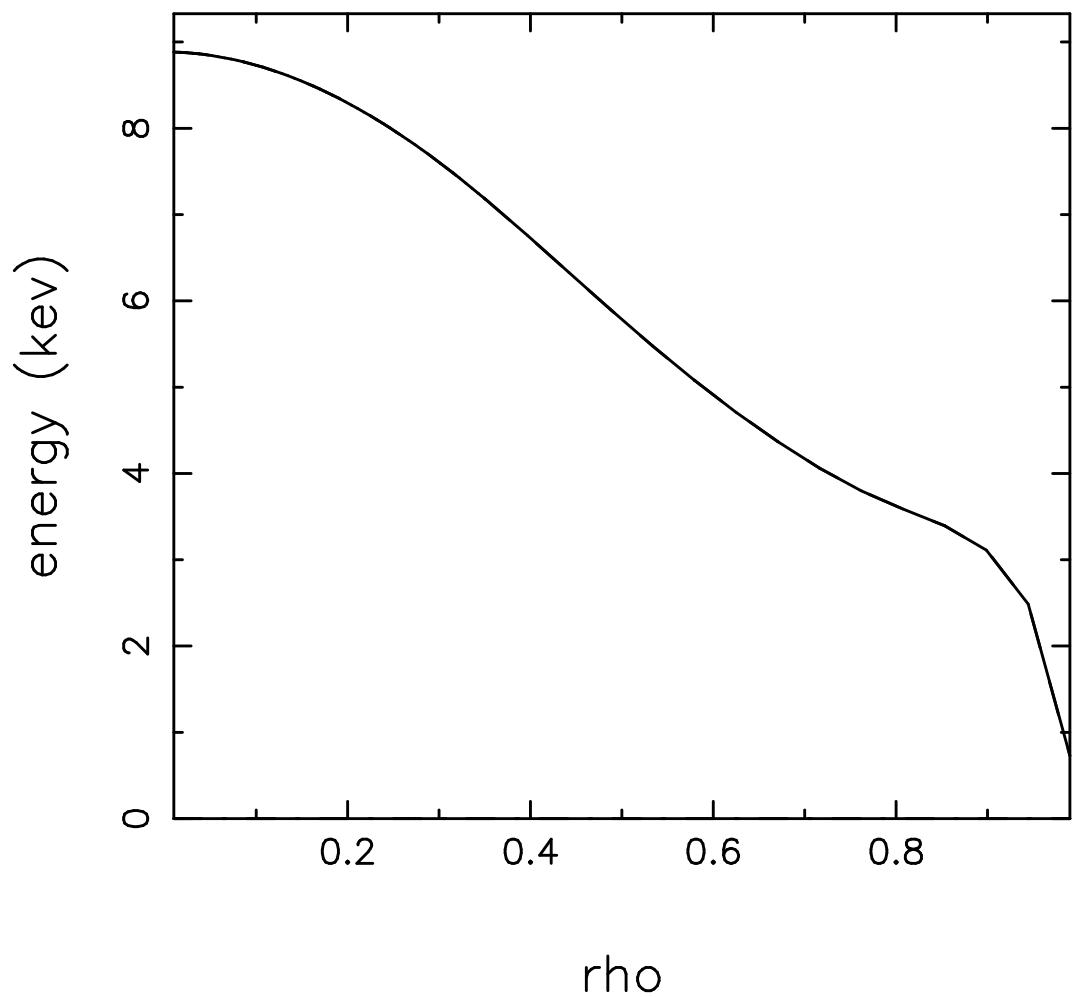
DENSITIES (/CC) OF SPECIES

species no. 5 e maxwell time step n= 0



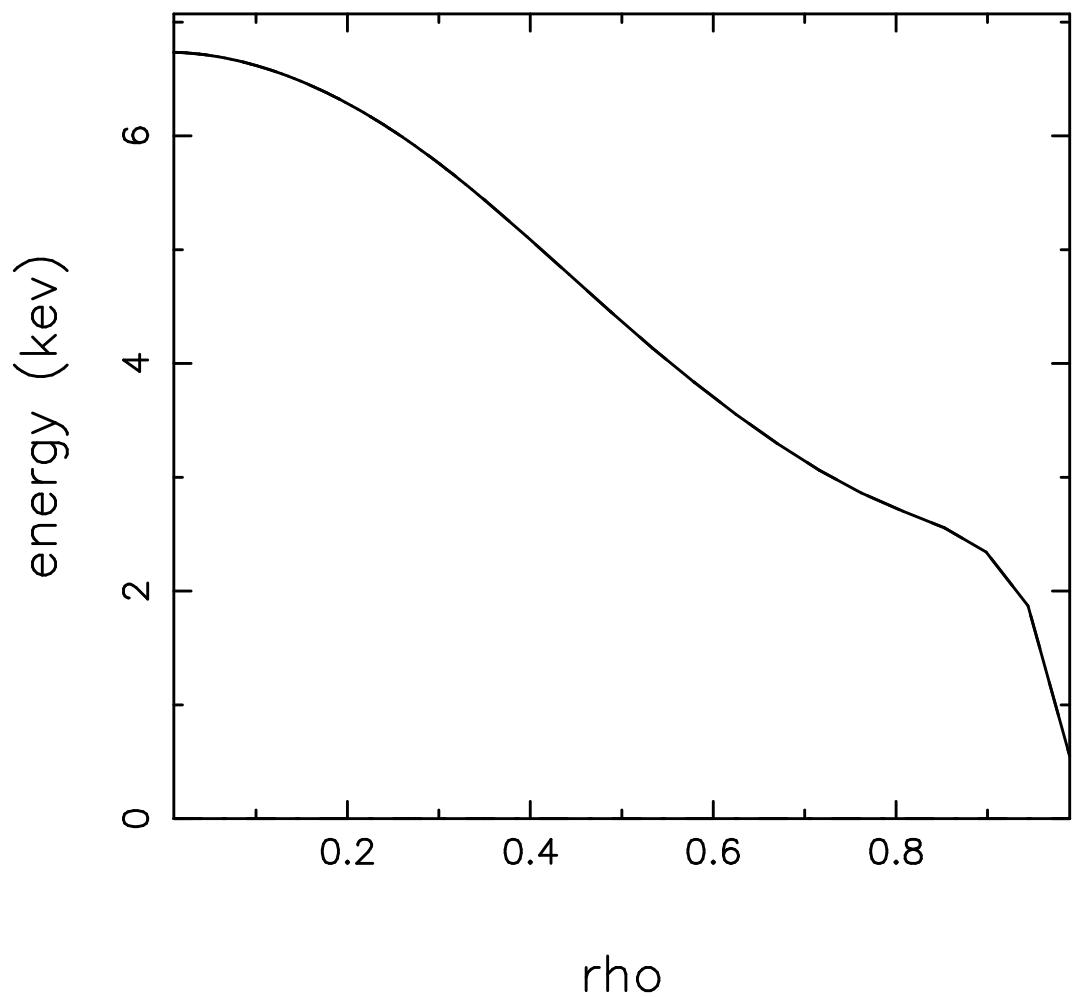
ENERGIES OF SPECIES IN KEV
(Solid: <..>_FSA)

species no. 1 D general time step n= 0



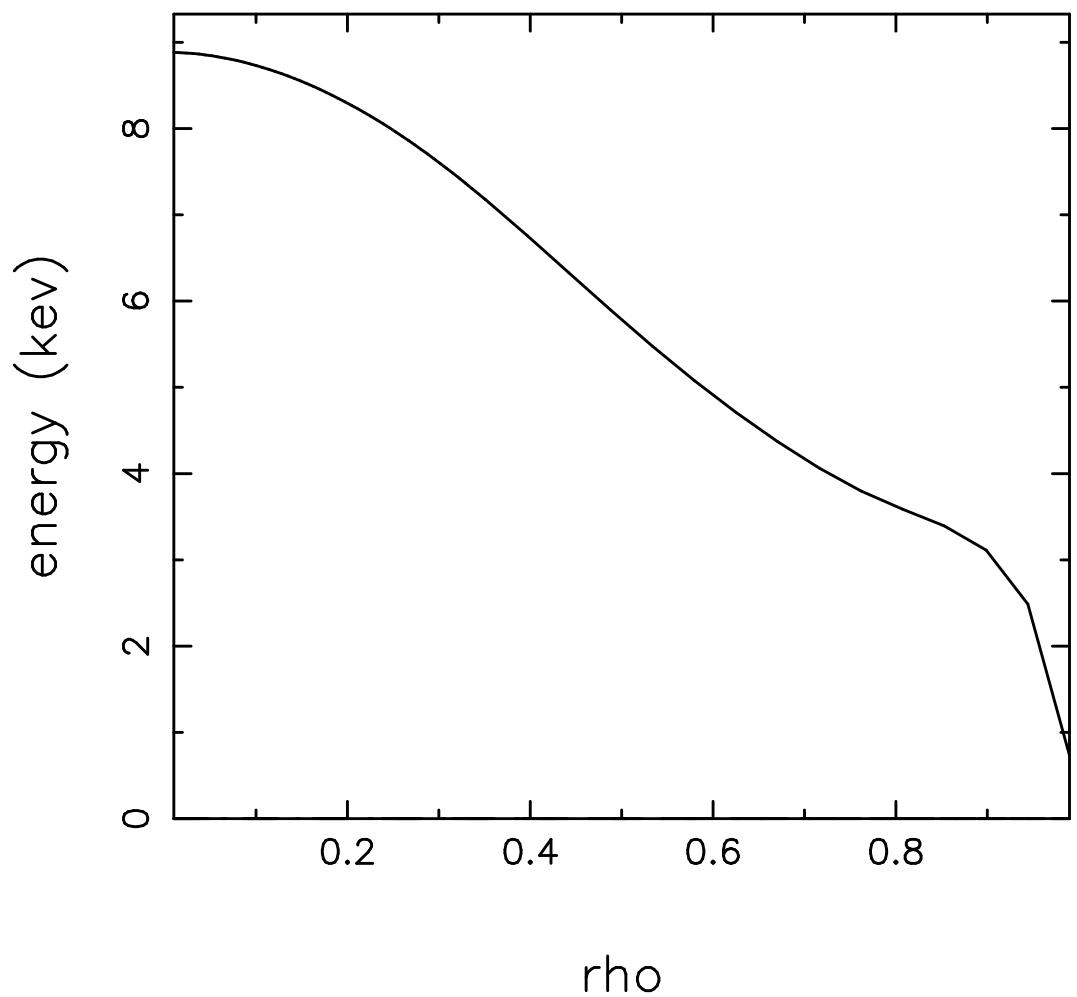
ENERGIES OF SPECIES IN KEV
(Solid: <..>_FSA)

species no. 2 e general time step n= 0



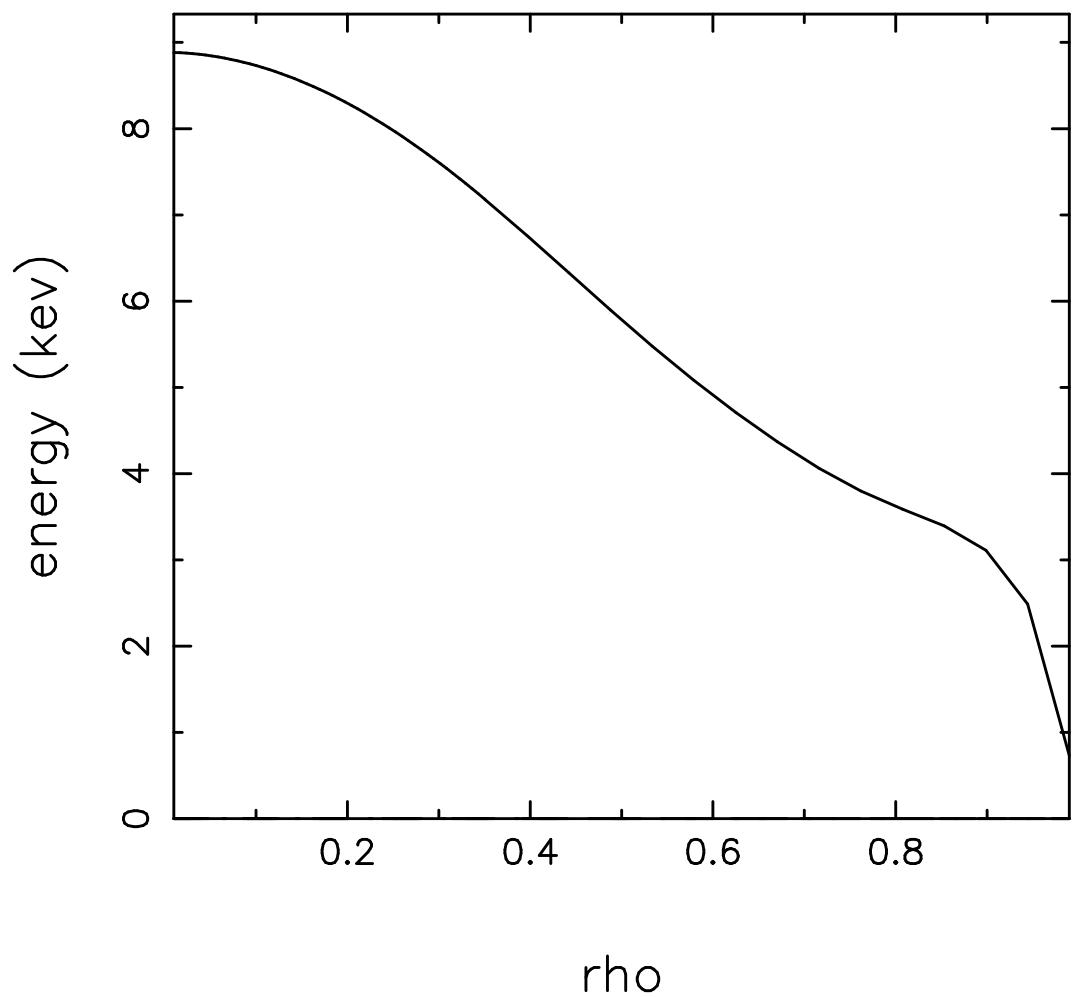
ENERGIES OF SPECIES IN KEV

species no. 3 D maxwell time step n= 0



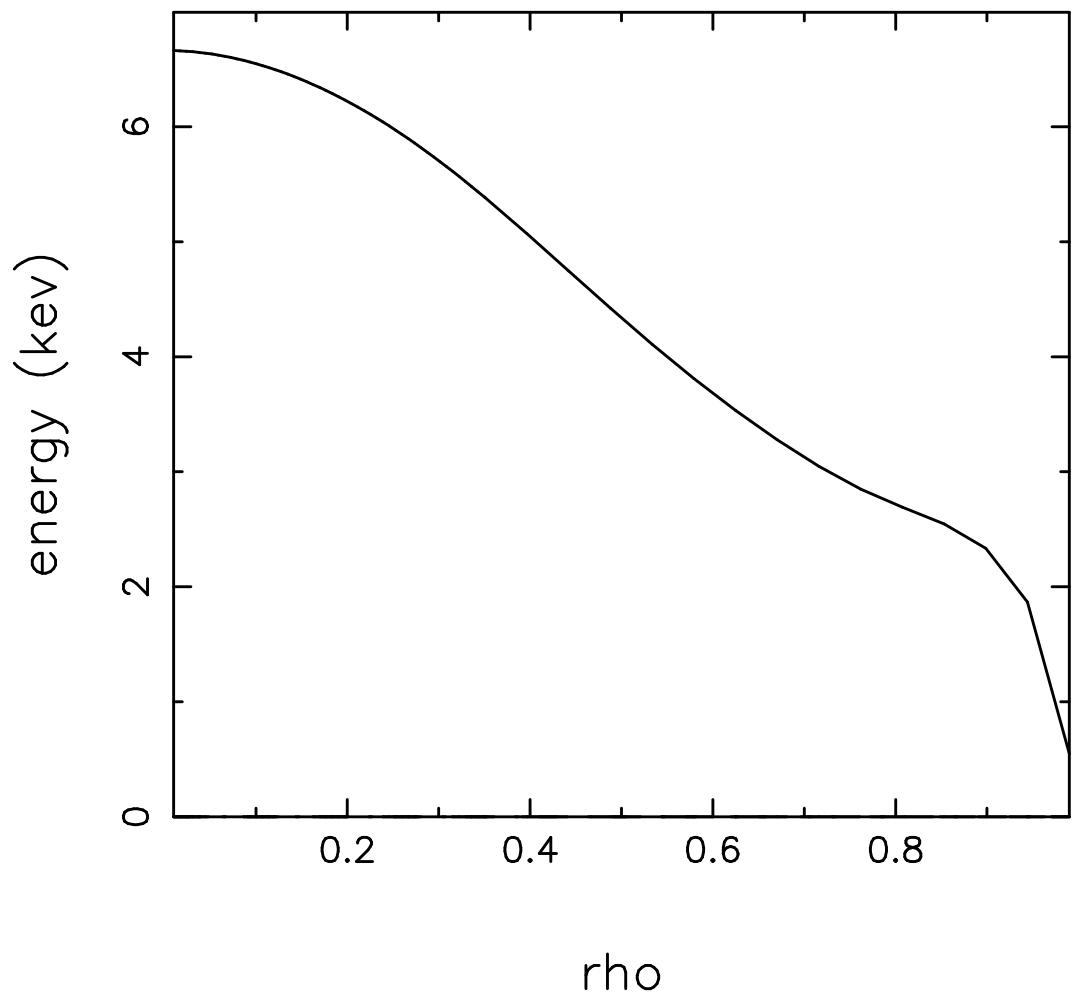
ENERGIES OF SPECIES IN KEV

species no. 4 impurity maxwell time step n= 0

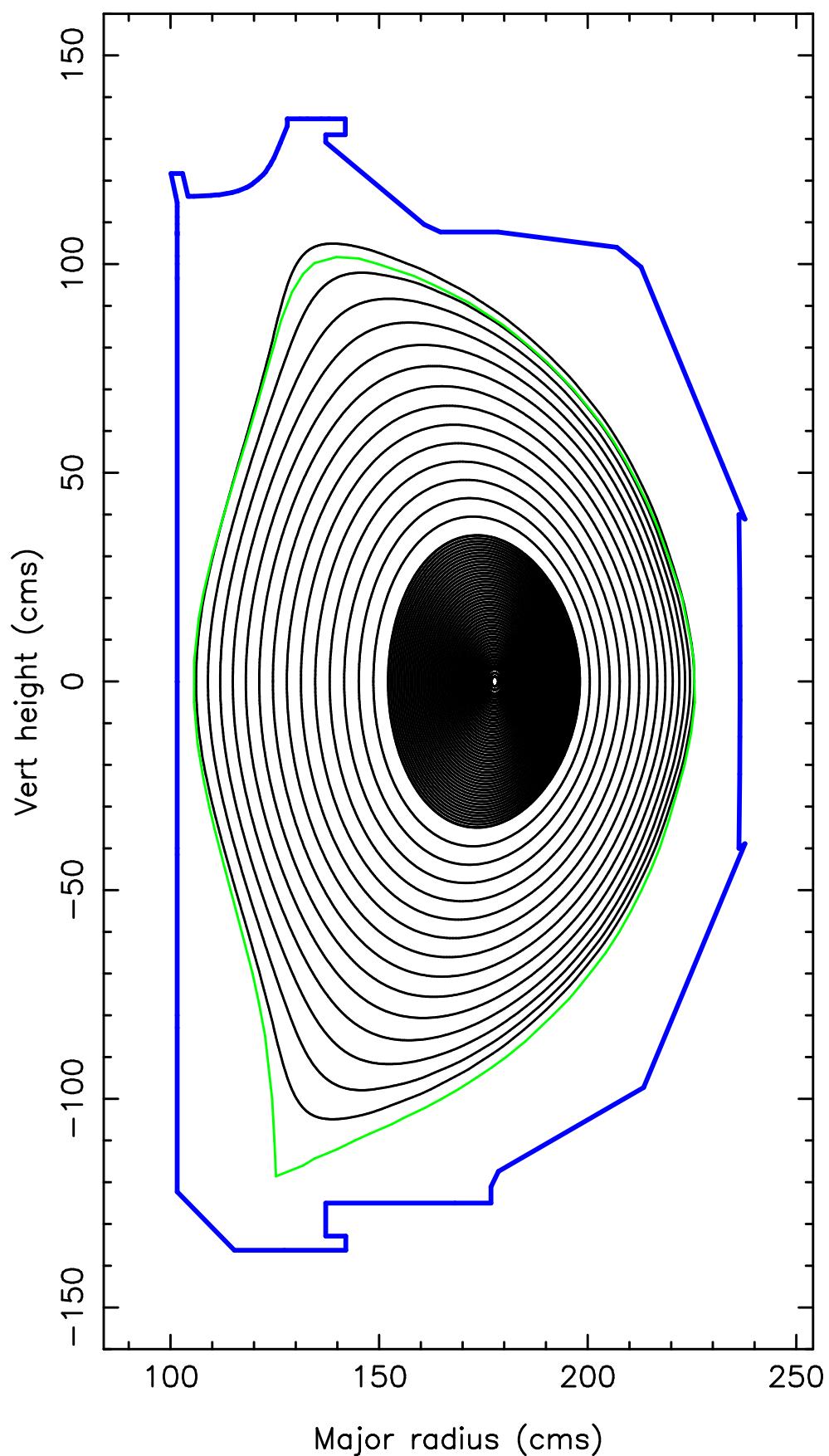


ENERGIES OF SPECIES IN KEV

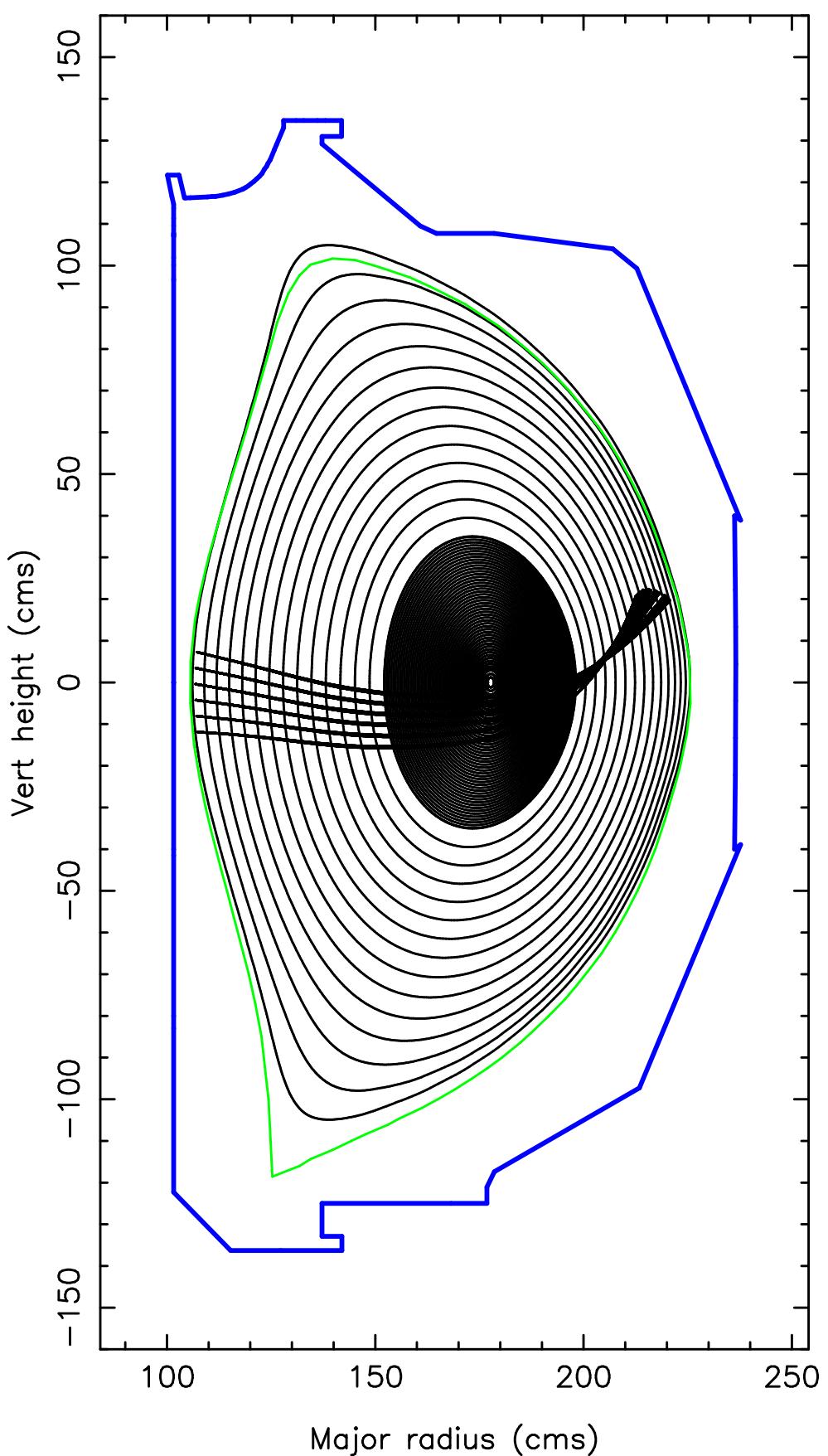
species no. 5 e maxwell time step n= 0



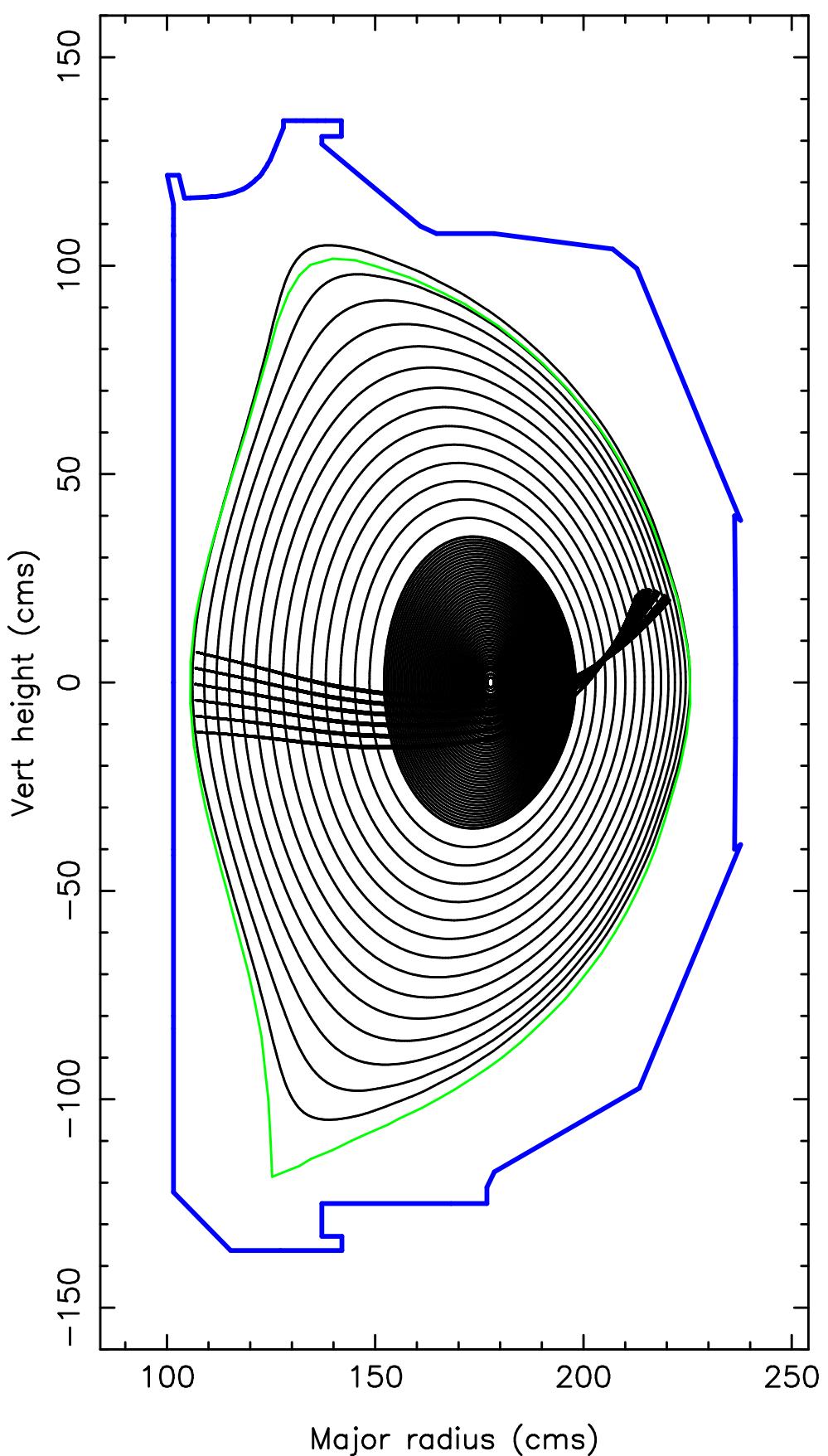
Fokker–Planck Flux Surfaces



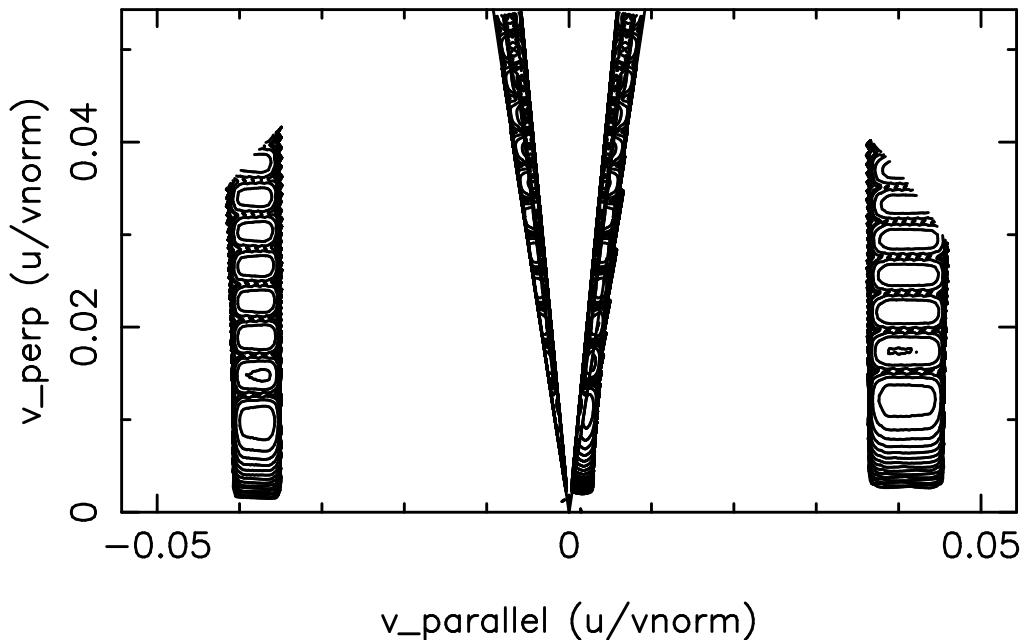
Fokker–Planck Flux Surfaces + Rays
krf type= 1 nharm1,nharms= 5 5 f[Hz]= 0.96000E+08



Fokker–Planck Flux Surfaces + Rays
krf type= 2 nharm1,nharms= 0 1 f[Hz]= 0.96000E+08



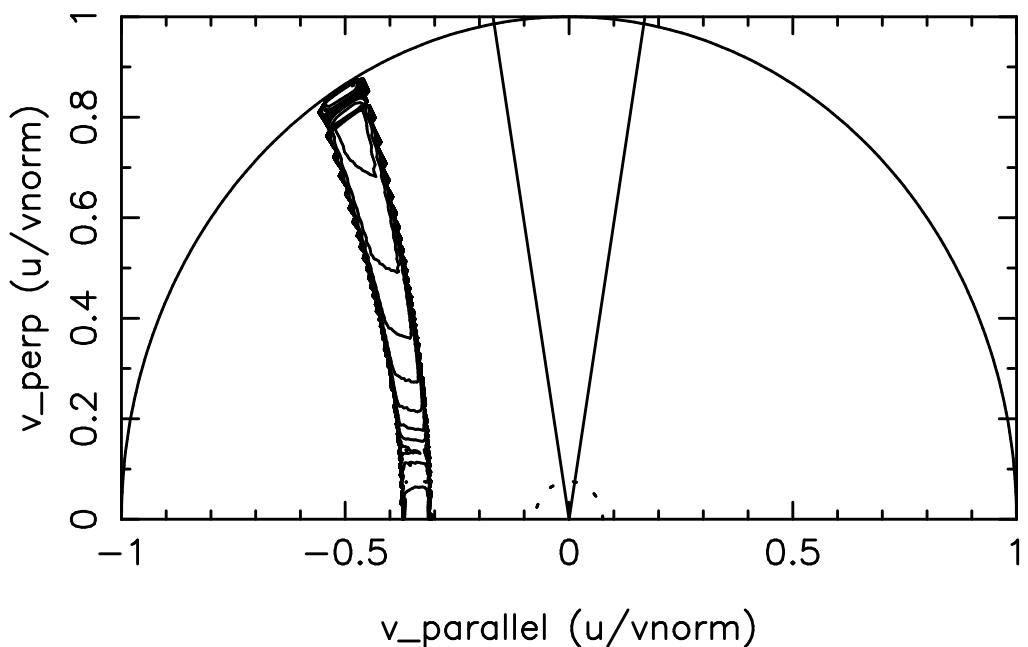
Contours of UrfB vs. v_parallel,v_perp



time step n= 99 time= 6.96E-01 secs
r/a= 3.776E-02 radial position (R)= 1.8022E+02 cm
rya= 3.776E-02 R=rpcon= 1.8022E+02 cm, Surf# 5

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surface number 5; all modes
Max value for this surface/mode: 0.216E+00
Species k=1

Contours of UrfB vs. v_parallel,v_perp



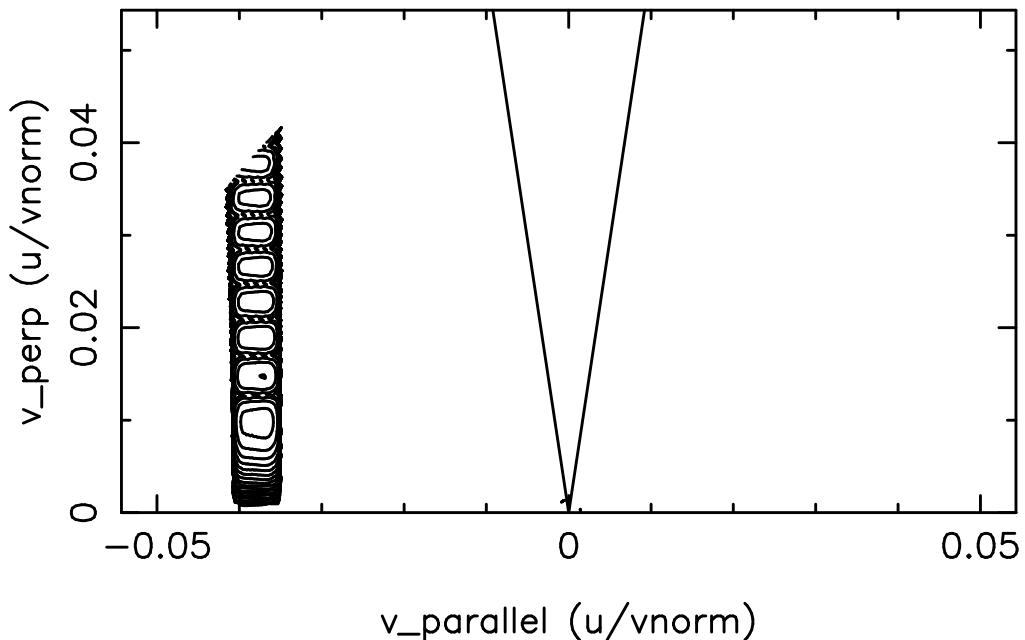
time step n= 99 time= 6.96E-01 secs
r/a= 3.776E-02 radial position (R)= 1.8022E+02 cm
rya= 3.776E-02 R=rpcon= 1.8022E+02 cm, Surf# 5

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surface number 5; all modes
Max value for this surface/mode: 0.466E+04
Species k=2

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surf.N 5; mode,nharm= 1 5; Species k=1
Max value for this surface/mode: 0.463E-04

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surf.N 5; mode,nharm= 2 6; Species k=1
Max value for this surface/mode: 0.859E-04

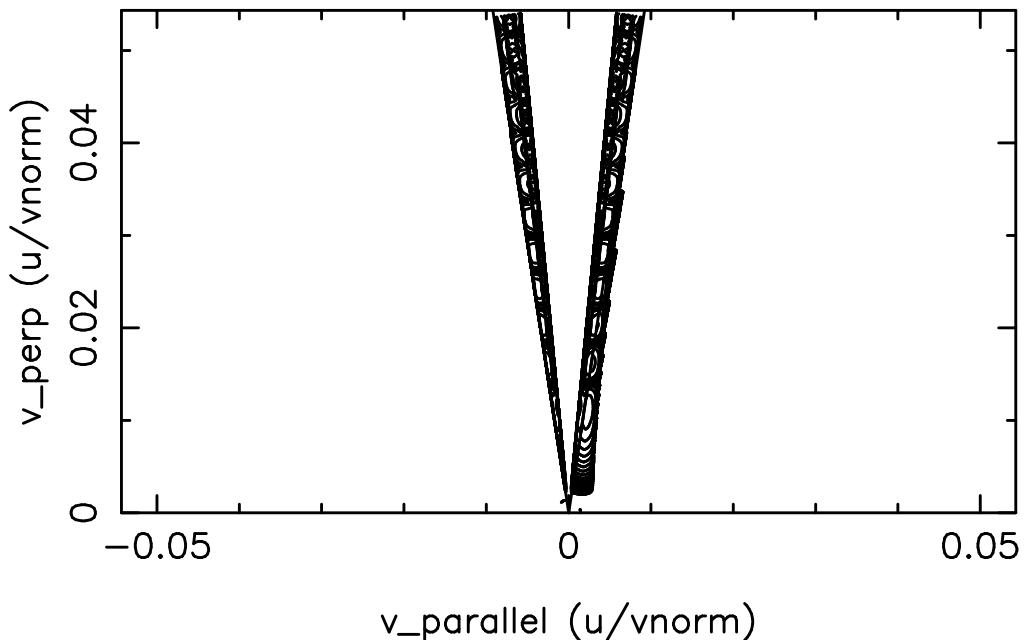
Contours of UrfB vs. v_parallel,v_perp



time step n= 99 time= 6.96E-01 secs
r/a= 3.776E-02 radial position (R)= 1.8022E+02 cm
rya= 3.776E-02 R=rpcon= 1.8022E+02 cm, Surf# 5

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surf.N 5; mode,nharm= 3 7; Species k=1
Max value for this surface/mode: 0.264E-03

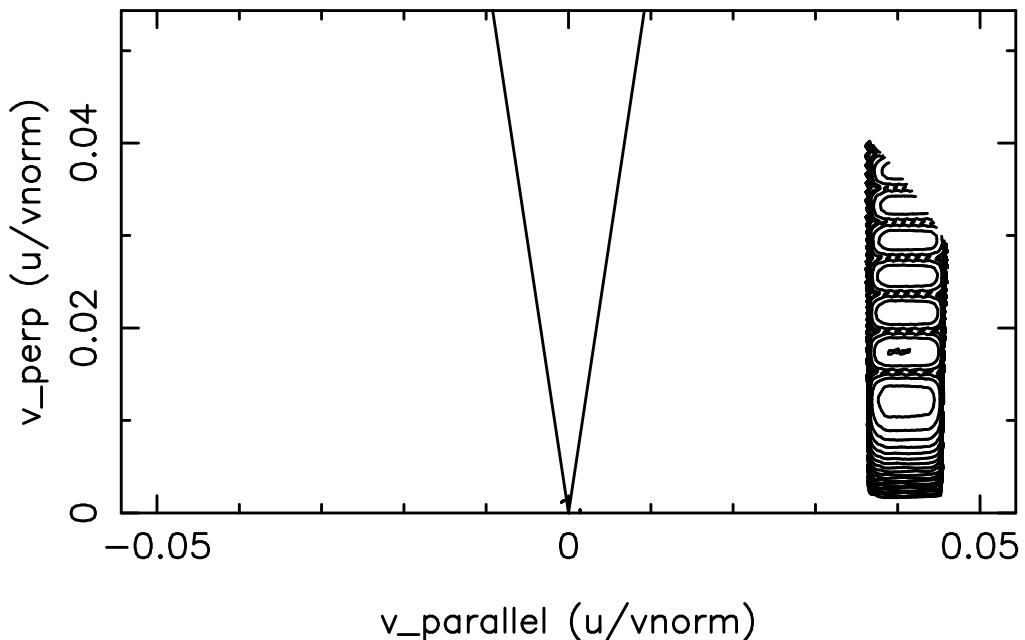
Contours of UrfB vs. v_parallel,v_perp



time step n= 99 time= 6.96E-01 secs
r/a= 3.776E-02 radial position (R)= 1.8022E+02 cm
rya= 3.776E-02 R=rpcon= 1.8022E+02 cm, Surf# 5

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surf.N 5; mode,nharm= 4 8; Species k=1
Max value for this surface/mode: 0.216E+00

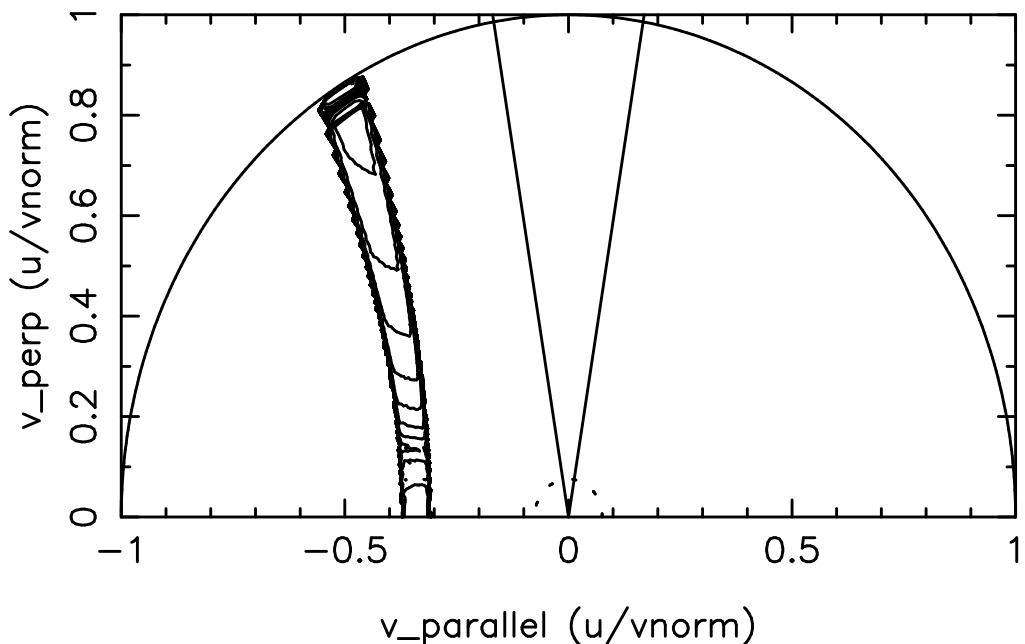
Contours of UrfB vs. v_parallel,v_perp



time step n= 99 time= 6.96E-01 secs
r/a= 3.776E-02 radial position (R)= 1.8022E+02 cm
rya= 3.776E-02 R=rpcon= 1.8022E+02 cm, Surf# 5

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surf.N 5; mode,nharm= 5 9; Species k=1
Max value for this surface/mode: 0.989E-01

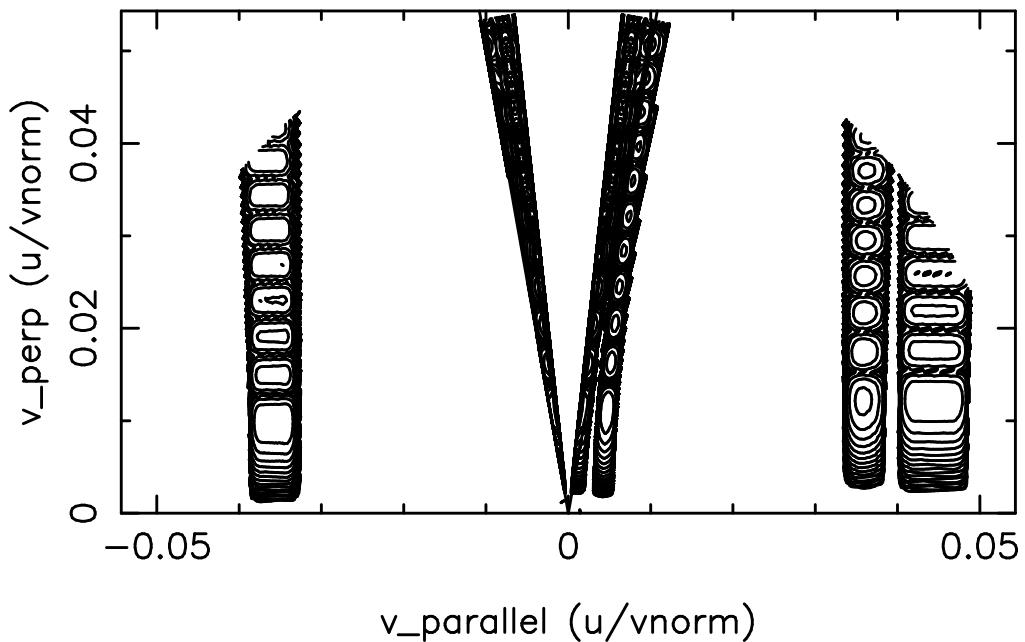
Contours of UrfB vs. v_parallel,v_perp



time step n= 99 time= 6.96E-01 secs
r/a= 3.776E-02 radial position (R)= 1.8022E+02 cm
rya= 3.776E-02 R=rpcon= 1.8022E+02 cm, Surf# 5

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surf.N 5; mode,nharm= 6 0; Species k=2
Max value for this surface/mode: 0.466E+04

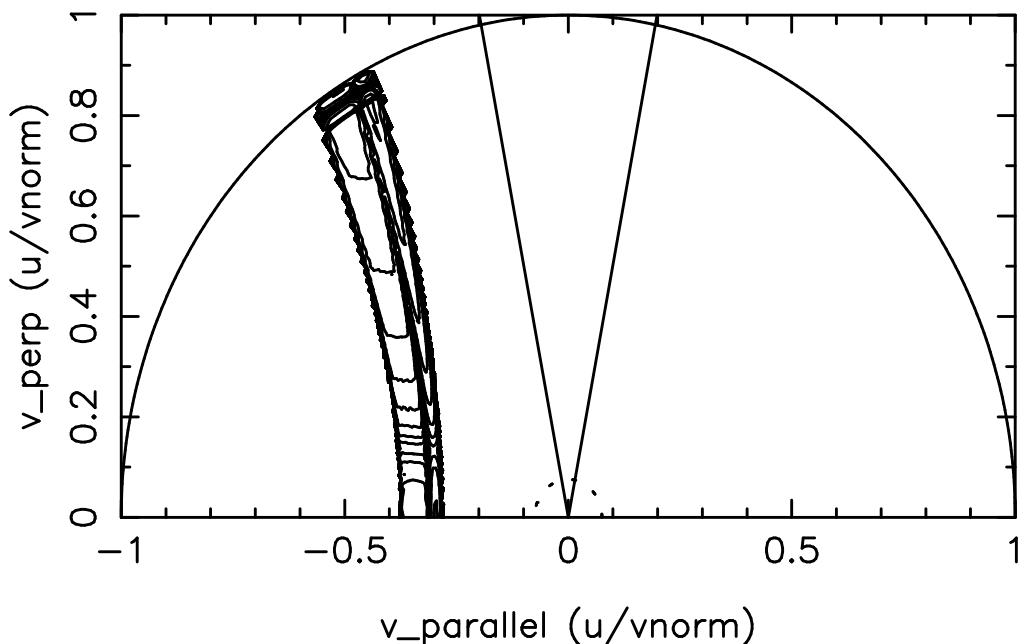
Contours of UrfB vs. v_parallel,v_perp



time step n= 99 time= 6.96E-01 secs
r/a= 5.163E-02 radial position (R)= 1.8112E+02 cm
rya= 5.163E-02 R=rpcon= 1.8112E+02 cm, Surf# 7

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surface number 7; all modes
Max value for this surface/mode: 0.214E+00
Species k=1

Contours of UrfB vs. v_parallel,v_perp



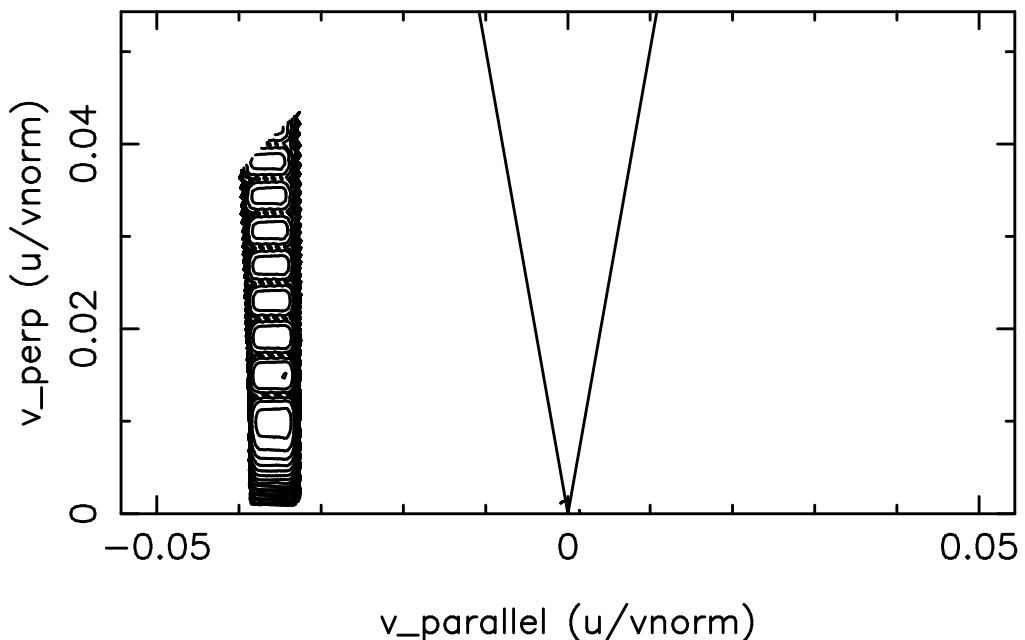
time step n= 99 time= 6.96E-01 secs
r/a= 5.163E-02 radial position (R)= 1.8112E+02 cm
rya= 5.163E-02 R=rpcon= 1.8112E+02 cm, Surf# 7

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surface number 7; all modes
Max value for this surface/mode: 0.426E+04
Species k=2

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surf.N 7; mode,nharm= 1 5; Species k=1
Max value for this surface/mode: 0.387E-04

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surf.N 7; mode,nharm= 2 6; Species k=1
Max value for this surface/mode: 0.699E-04

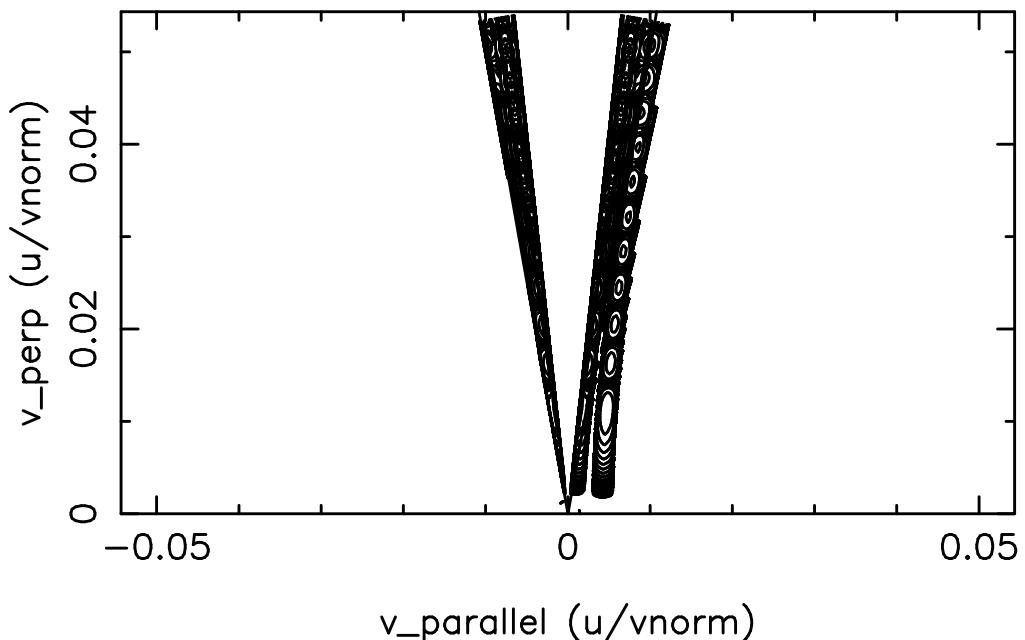
Contours of UrfB vs. v_parallel,v_perp



time step n= 99 time= 6.96E-01 secs
r/a= 5.163E-02 radial position (R)= 1.8112E+02 cm
rya= 5.163E-02 R=rpcon= 1.8112E+02 cm, Surf# 7

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surf.N 7; mode,nharm= 3 7; Species k=1
Max value for this surface/mode: 0.258E-03

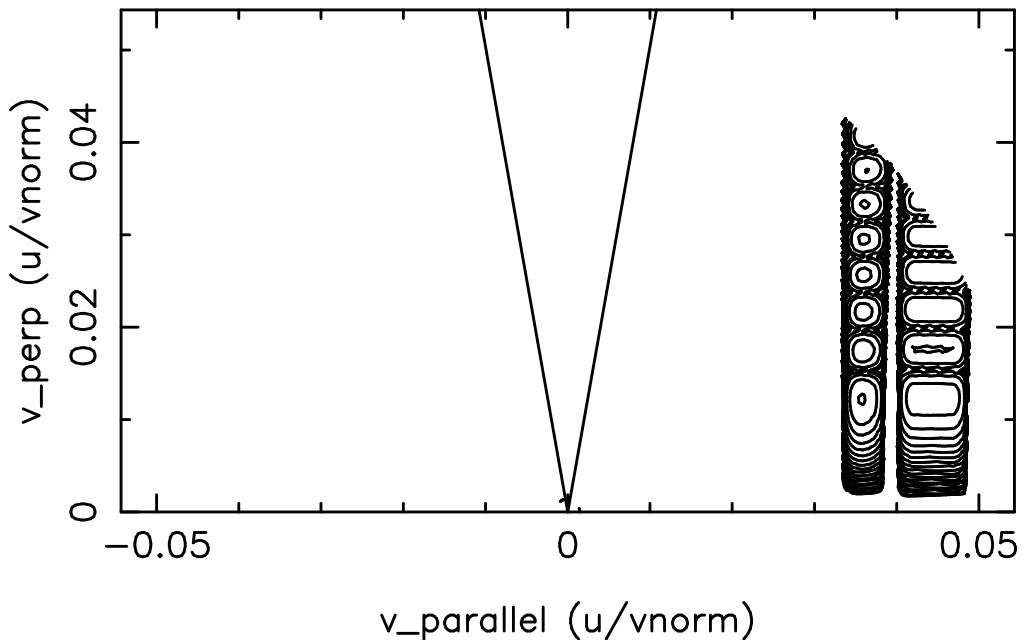
Contours of UrfB vs. v_parallel,v_perp



time step n= 99 time= 6.96E-01 secs
r/a= 5.163E-02 radial position (R)= 1.8112E+02 cm
rya= 5.163E-02 R=rpcon= 1.8112E+02 cm, Surf# 7

Contours of the rf (v, v) diffusion coefficient, urfb
Flux surf.N 7; mode,nharm= 4 8; Species k=1
Max value for this surface/mode: 0.365E-01

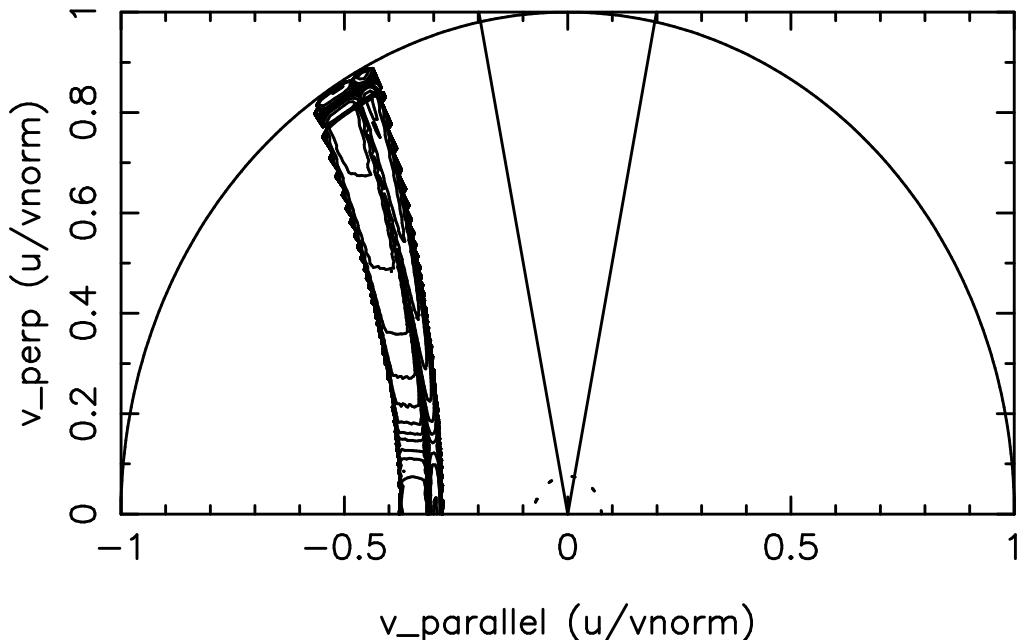
Contours of UrfB vs. v_parallel,v_perp



time step n= 99 time= 6.96E-01 secs
r/a= 5.163E-02 radial position (R)= 1.8112E+02 cm
rya= 5.163E-02 R=rpcon= 1.8112E+02 cm, Surf# 7

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surf.N 7; mode,nharm= 5 9; Species k=1
Max value for this surface/mode: 0.214E+00

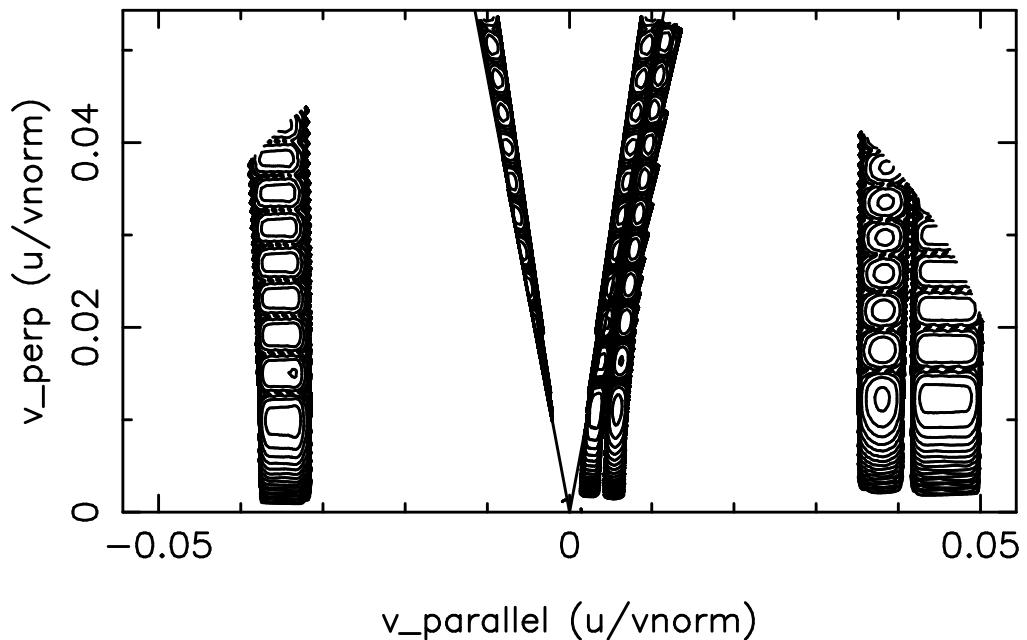
Contours of UrfB vs. v_parallel,v_perp



time step n= 99 time= 6.96E-01 secs
r/a= 5.163E-02 radial position (R)= 1.8112E+02 cm
rya= 5.163E-02 R=rpcon= 1.8112E+02 cm, Surf# 7

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surf.N 7; mode,nharm= 6 0; Species k=2
Max value for this surface/mode: 0.426E+04

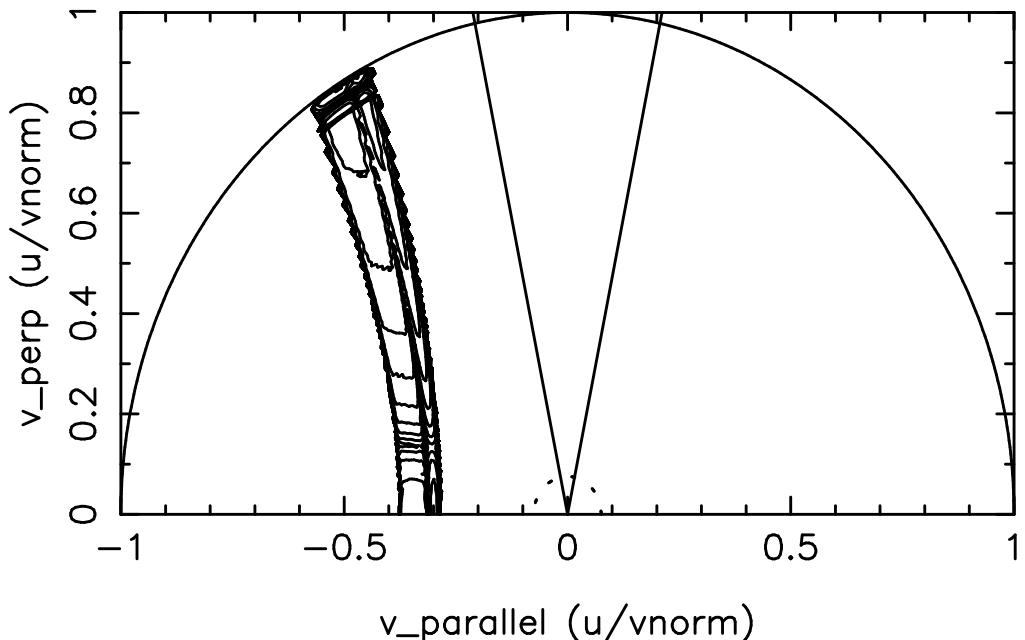
Contours of UrfB vs. v_parallel,v_perp



time step n= 99 time= 6.96E-01 secs
r/a= 5.857E-02 radial position (R)= 1.8156E+02 cm
rya= 5.857E-02 R=rpcon= 1.8156E+02 cm, Surf# 8

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surface number 8; all modes
Max value for this surface/mode: 0.202E+00
Species k=1

Contours of UrfB vs. v_parallel,v_perp



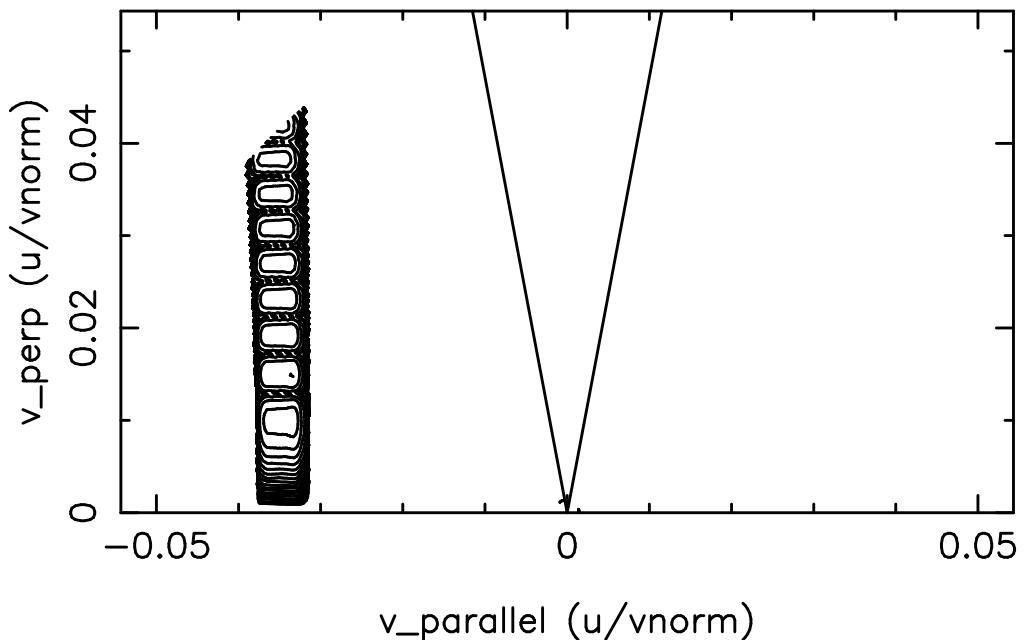
time step n= 99 time= 6.96E-01 secs
r/a= 5.857E-02 radial position (R)= 1.8156E+02 cm
rya= 5.857E-02 R=rpcon= 1.8156E+02 cm, Surf# 8

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surface number 8; all modes
Max value for this surface/mode: 0.431E+04
Species k=2

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surf.N 8; mode,nharm= 1 5; Species k=1
Max value for this surface/mode: 0.533E-04

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surf.N 8; mode,nharm= 2 6; Species k=1
Max value for this surface/mode: 0.845E-04

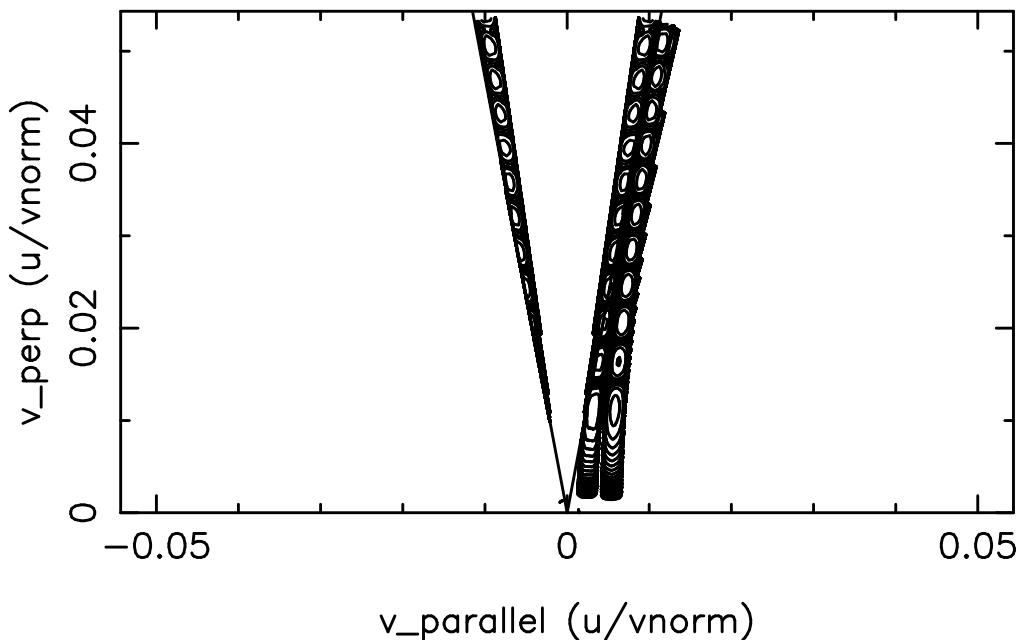
Contours of UrfB vs. v_parallel,v_perp



time step n= 99 time= 6.96E-01 secs
r/a= 5.857E-02 radial position (R)= 1.8156E+02 cm
rya= 5.857E-02 R=rpcon= 1.8156E+02 cm, Surf# 8

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surf.N 8; mode,nharm= 3 7; Species k=1
Max value for this surface/mode: 0.279E-03

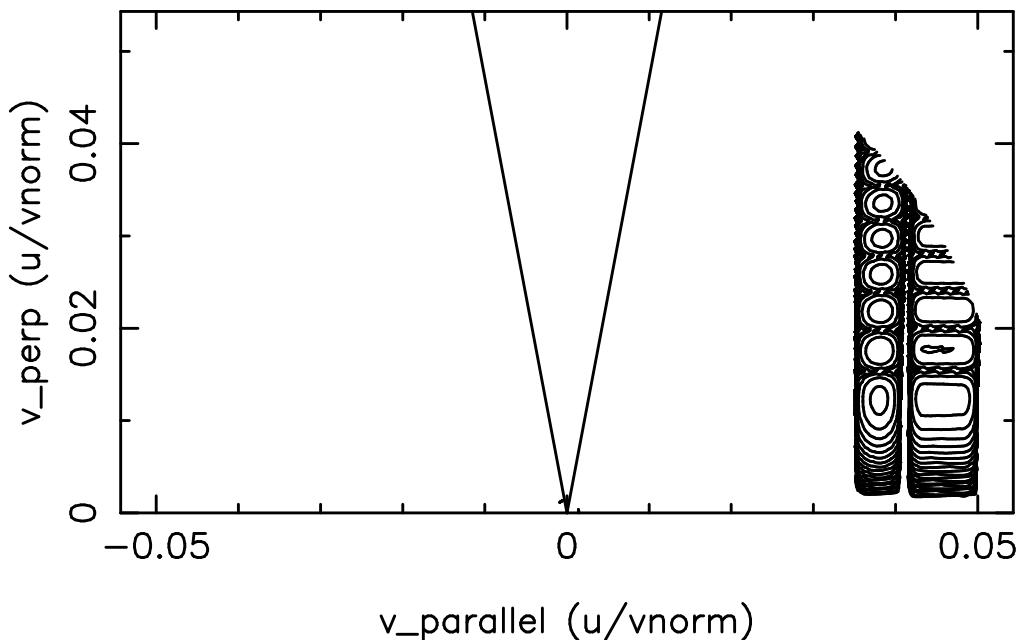
Contours of UrfB vs. v_parallel,v_perp



time step n= 99 time= 6.96E-01 secs
r/a= 5.857E-02 radial position (R)= 1.8156E+02 cm
rya= 5.857E-02 R=rpcon= 1.8156E+02 cm, Surf# 8

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surf.N 8; mode,nharm= 4 8; Species k=1
Max value for this surface/mode: 0.166E-01

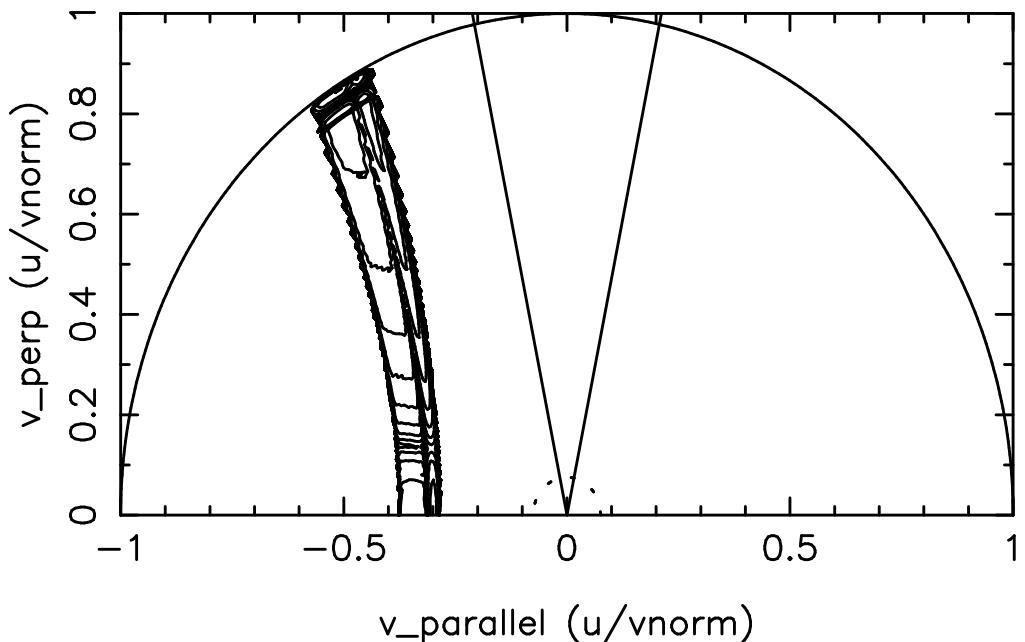
Contours of UrfB vs. v_parallel,v_perp



time step n= 99 time= 6.96E-01 secs
r/a= 5.857E-02 radial position (R)= 1.8156E+02 cm
rya= 5.857E-02 R=rpcon= 1.8156E+02 cm, Surf# 8

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surf.N 8; mode,nharm= 5 9; Species k=1
Max value for this surface/mode: 0.202E+00

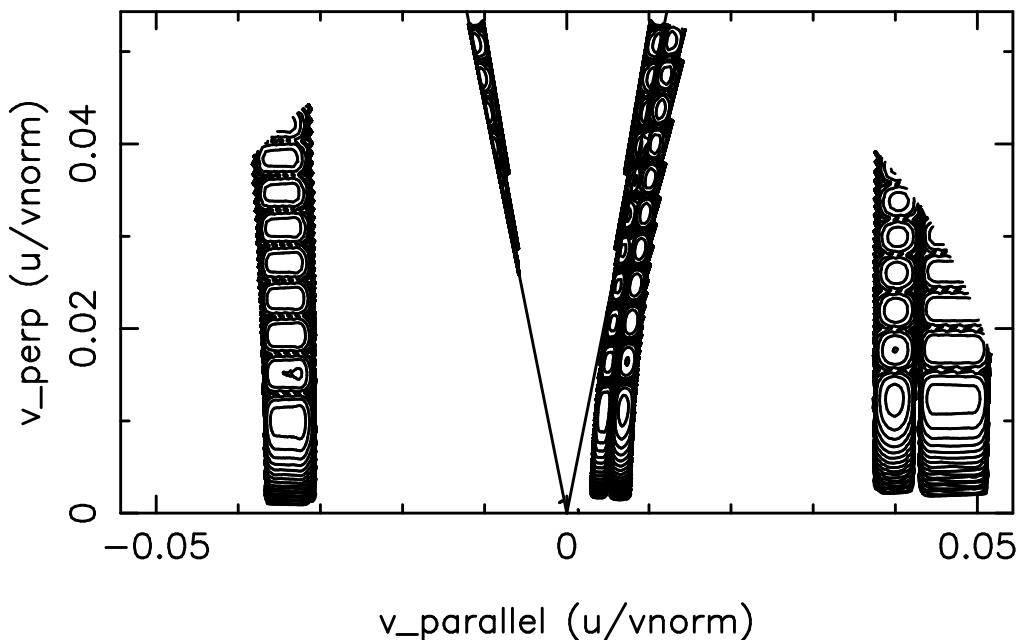
Contours of UrfB vs. v_parallel,v_perp



time step n= 99 time= 6.96E-01 secs
r/a= 5.857E-02 radial position (R)= 1.8156E+02 cm
rya= 5.857E-02 R=rpcon= 1.8156E+02 cm, Surf# 8

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surf.N 8; mode,nharm= 6 0; Species k=2
Max value for this surface/mode: 0.431E+04

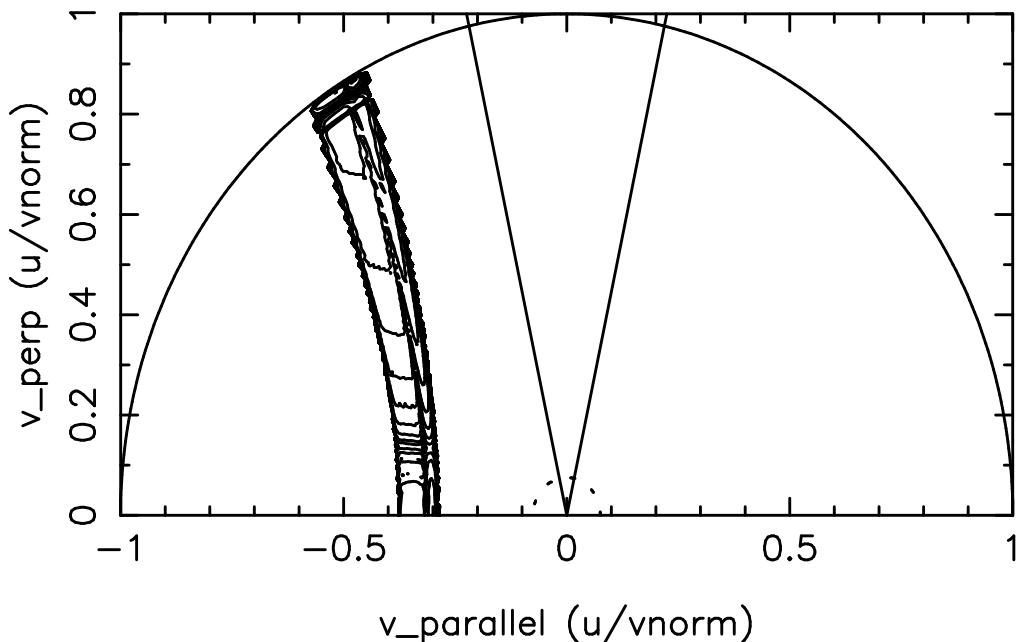
Contours of UrfB vs. v_parallel,v_perp



time step n= 99 time= 6.96E-01 secs
r/a= 6.551E-02 radial position (R)= 1.8200E+02 cm
rya= 6.551E-02 R=rpcon= 1.8200E+02 cm, Surf# 9

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surface number 9; all modes
Max value for this surface/mode: 0.212E+00
Species k=1

Contours of UrfB vs. v_parallel,v_perp



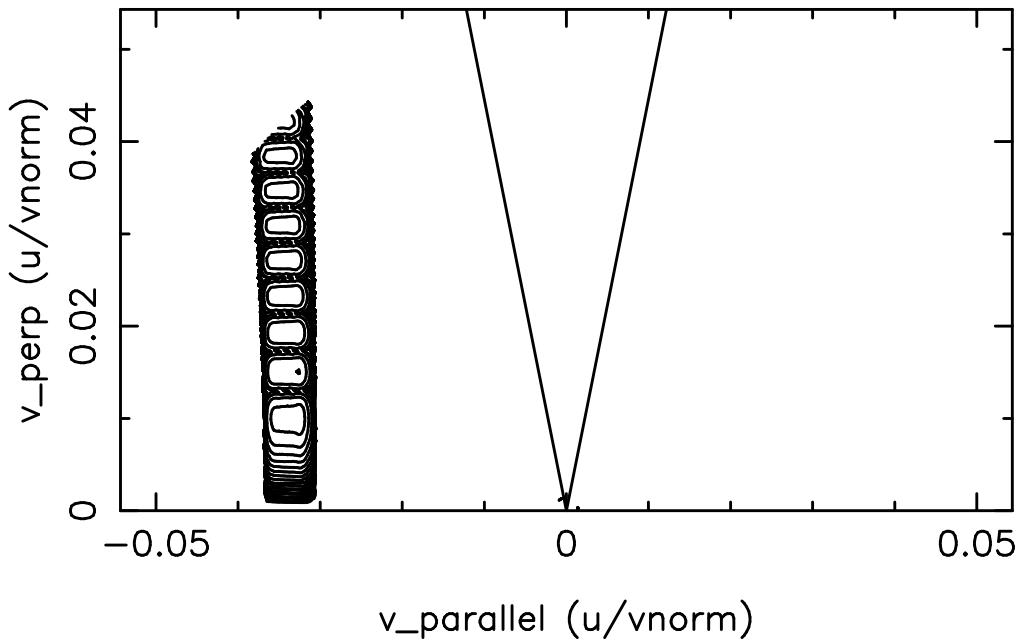
time step n= 99 time= 6.96E-01 secs
r/a= 6.551E-02 radial position (R)= 1.8200E+02 cm
rya= 6.551E-02 R=rpcon= 1.8200E+02 cm, Surf# 9

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surface number 9; all modes
Max value for this surface/mode: 0.395E+04
Species k=2

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surf.N 9; mode,nharm= 1 5; Species k=1
Max value for this surface/mode: 0.404E-04

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surf.N 9; mode,nharm= 2 6; Species k=1
Max value for this surface/mode: 0.770E-04

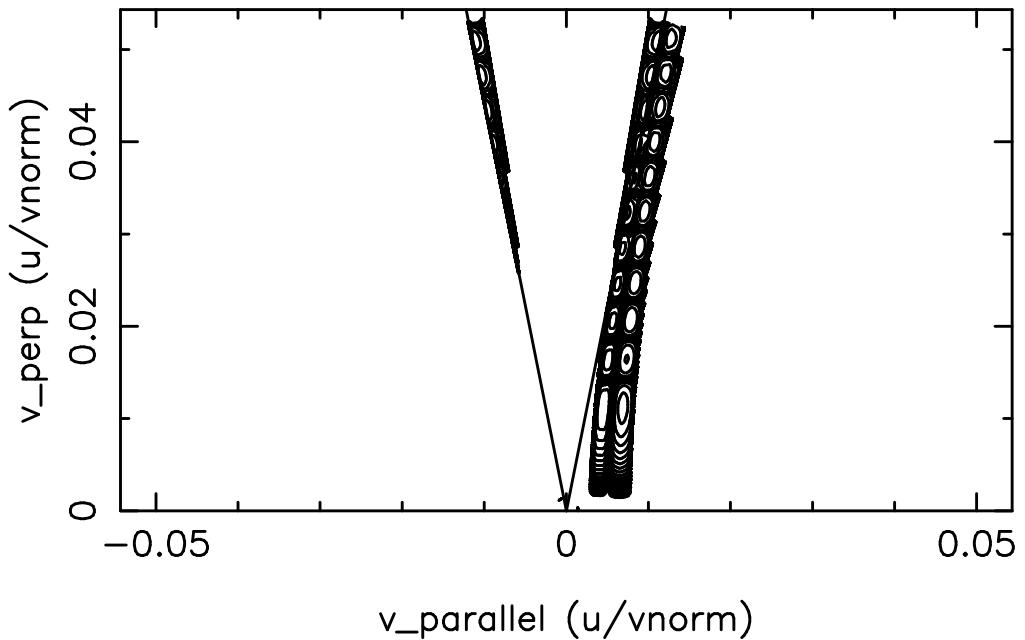
Contours of UrfB vs. v_parallel,v_perp



time step n= 99 time= 6.96E-01 secs
r/a= 6.551E-02 radial position (R)= 1.8200E+02 cm
rya= 6.551E-02 R=rpcon= 1.8200E+02 cm, Surf# 9

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surf.N 9; mode,nharm= 3 7; Species k=1
Max value for this surface/mode: 0.259E-03

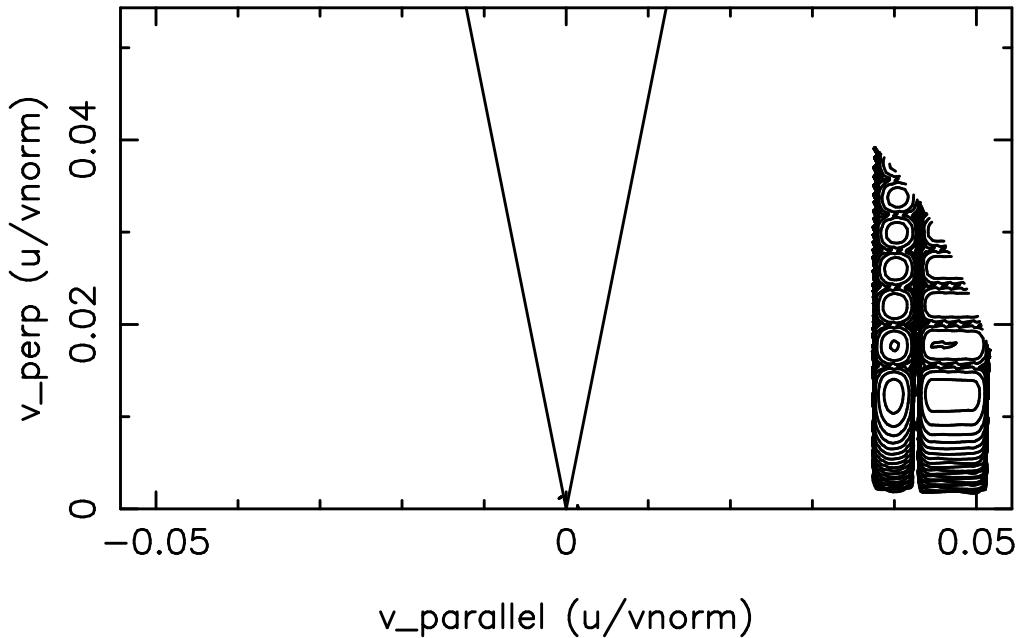
Contours of UrfB vs. v_parallel,v_perp



time step n= 99 time= 6.96E-01 secs
r/a= 6.551E-02 radial position (R)= 1.8200E+02 cm
rya= 6.551E-02 R=rpcon= 1.8200E+02 cm, Surf# 9

Contours of the rf (v, v) diffusion coefficient, urfb
Flux surf.N 9; mode,nharm= 4 8; Species k=1
Max value for this surface/mode: 0.229E-01

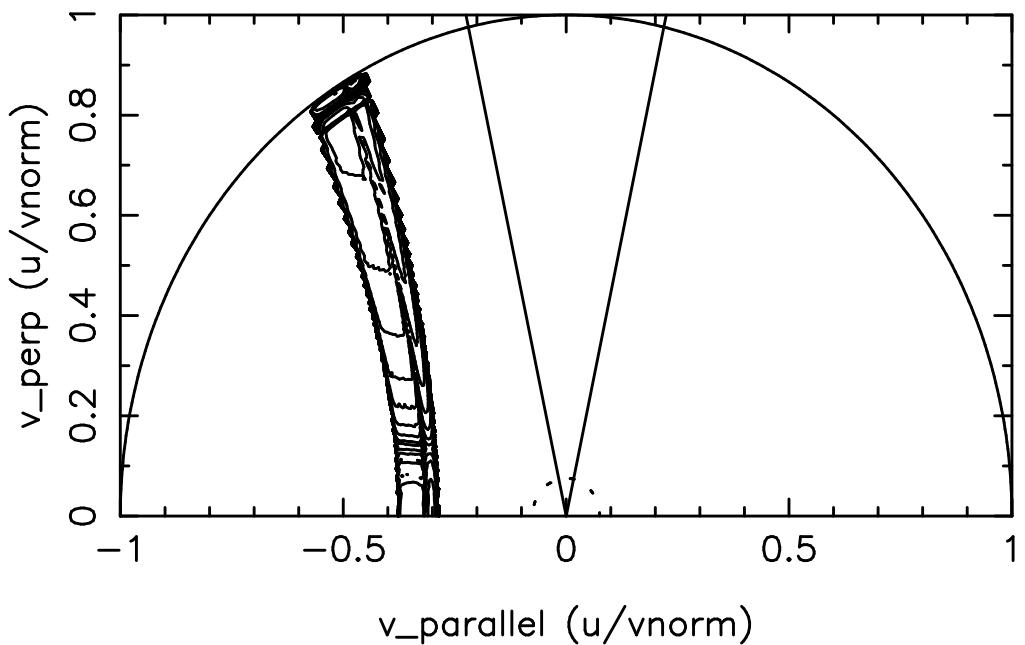
Contours of UrfB vs. v_parallel,v_perp



time step n= 99 time= 6.96E-01 secs
r/a= 6.551E-02 radial position (R)= 1.8200E+02 cm
rya= 6.551E-02 R=rpcon= 1.8200E+02 cm, Surf# 9

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surf.N 9; mode,nharm= 5 9; Species k=1
Max value for this surface/mode: 0.212E+00

Contours of UrfB vs. v_parallel,v_perp

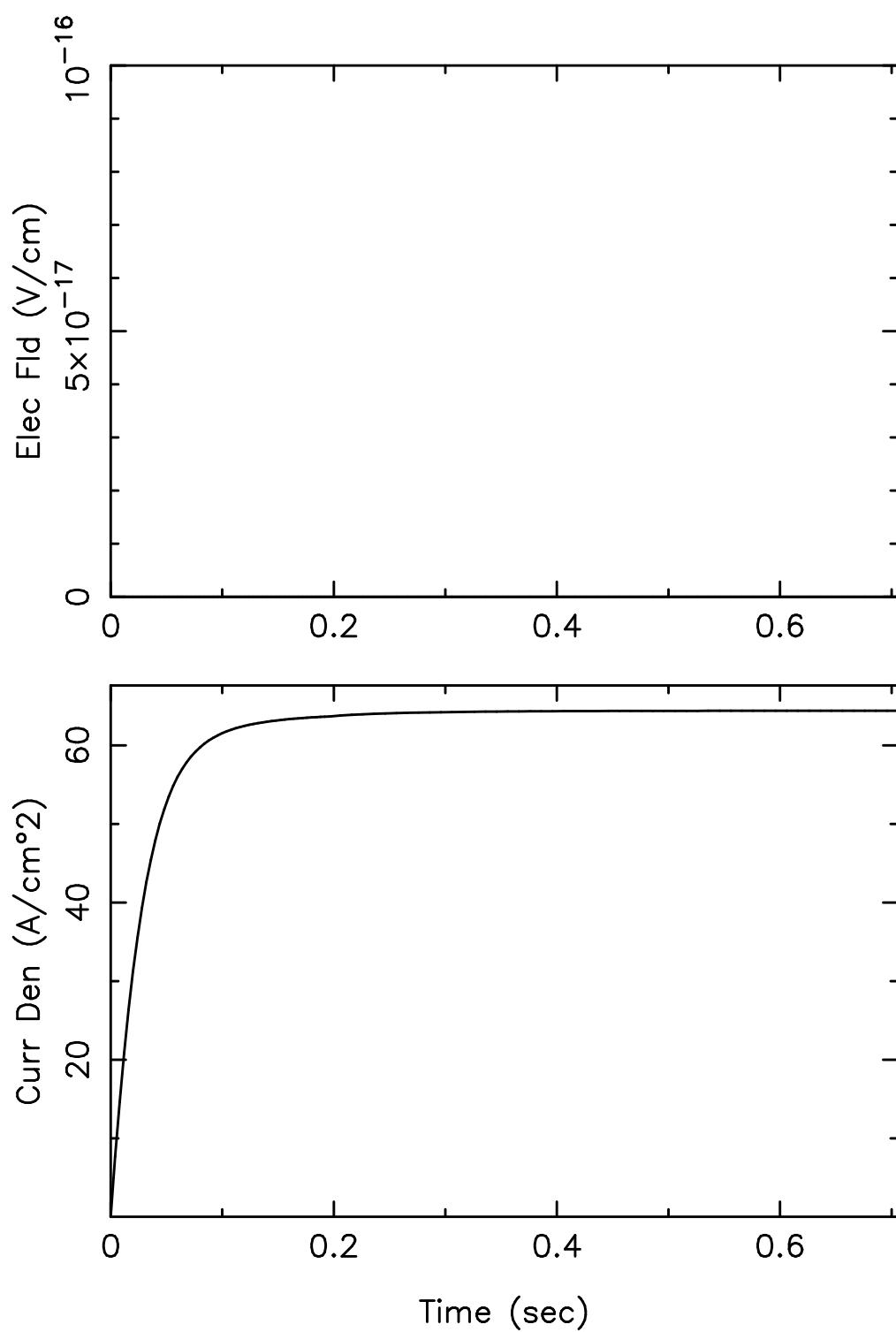


time step n= 99 time= 6.96E-01 secs
r/a= 6.551E-02 radial position (R)= 1.8200E+02 cm
rya= 6.551E-02 R=rpcon= 1.8200E+02 cm, Surf# 9

Contours of the rf (v,v) diffusion coefficient, urfb
Flux surf.N 9; mode,nharm= 6 0; Species k=2
Max value for this surface/mode: 0.395E+04

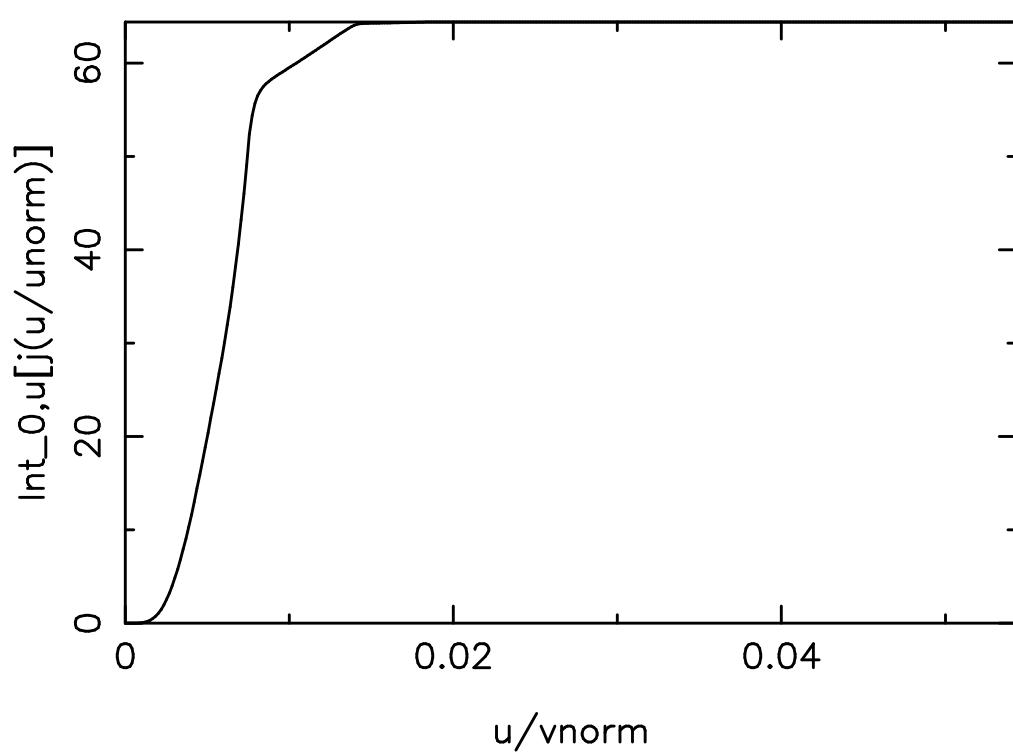
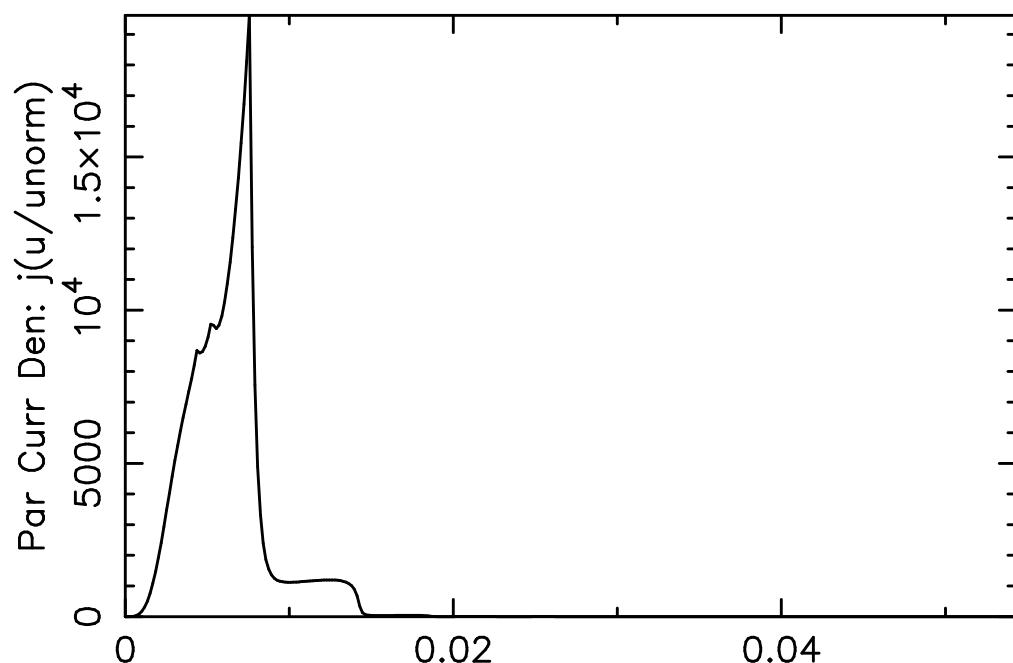
LOCAL RADIAL QUANTITIES

```
time step n= 100,      time= 7.0600E-01 secs
flux surf= 5      total flux surfs= 65
r/a= 3.776E-02      radial position (R)= 1.8022E+02 cms
rya= 3.776E-02      R=rpcon= 1.802E+02 cm
enormi, enorme(=enorm) (kev) = 3250.000      300.000
vnorm/c = 1.2324136
vthe (sqrt(te/me))/c = 0.0931237
vthe/vnorm = 0.0755620
k= 1 vth(k)/vnorm = 0.0014402
k= 2 vth(k)/vnorm = 0.0755620
k= 3 vth(k)/vnorm = 0.0014402
k= 4 vth(k)/vnorm = 0.0001438
k= 5 vth(k)/vnorm = 0.0755620
```

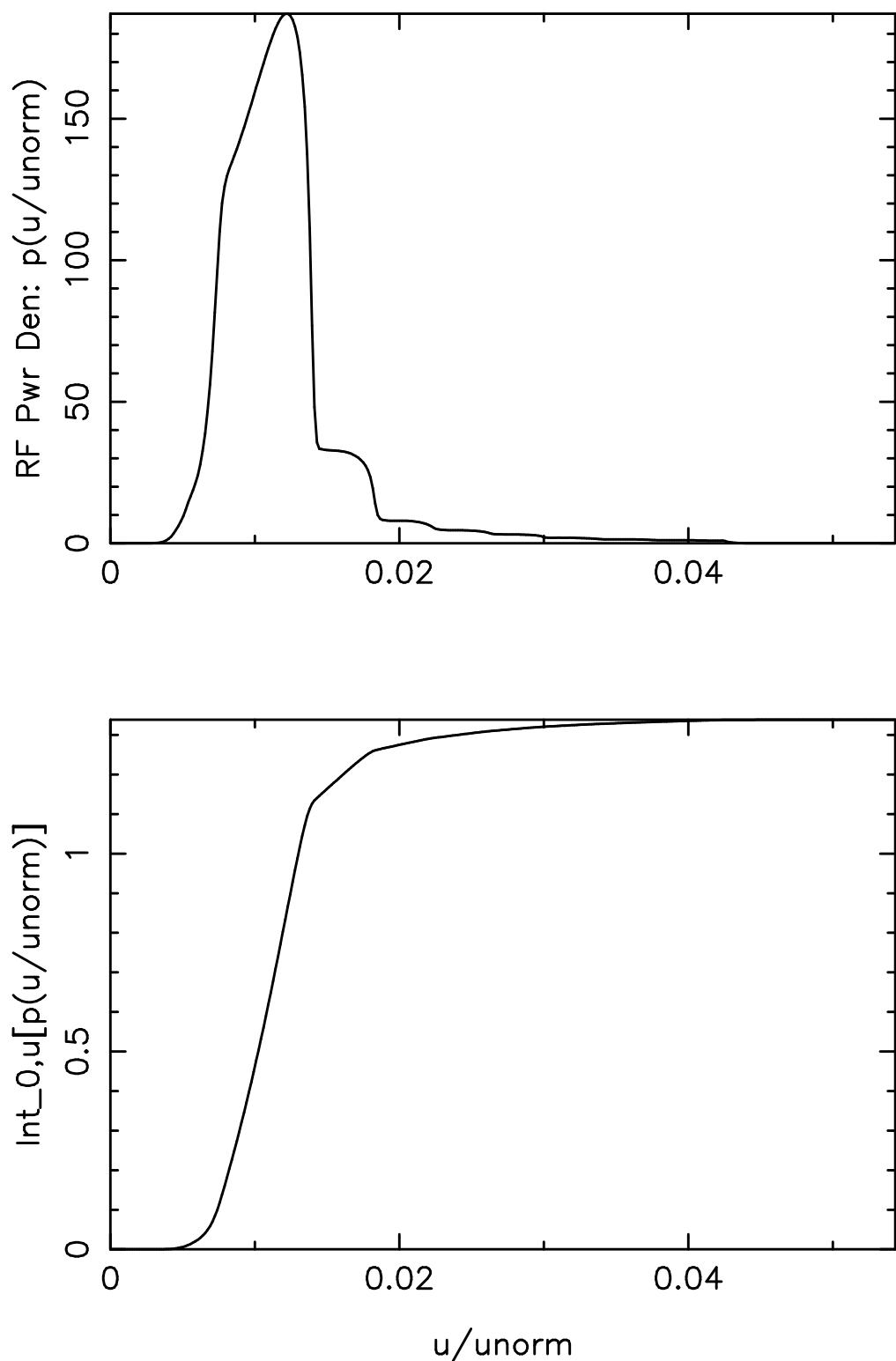


Electric field = 0.0000E+00 (V/cm)
FSA current den of species 1 = 6.4403E+01 Amps/cm**2

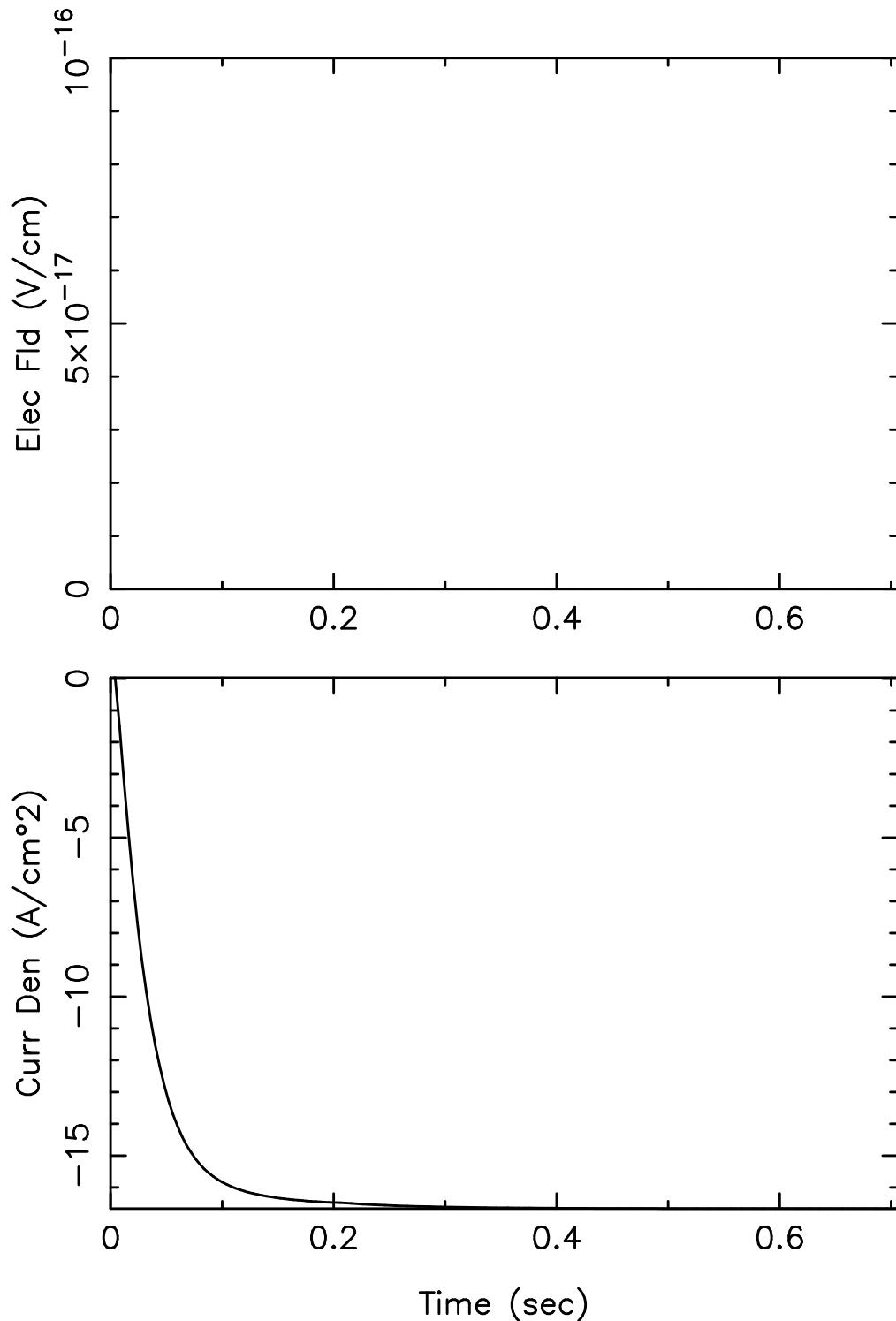
Current drive efficiency $j/(2\pi R \rho r_f)$ = 4.3119E-02 A/W



Species: 1 Current = 0.6440E+02 Amps/cm²



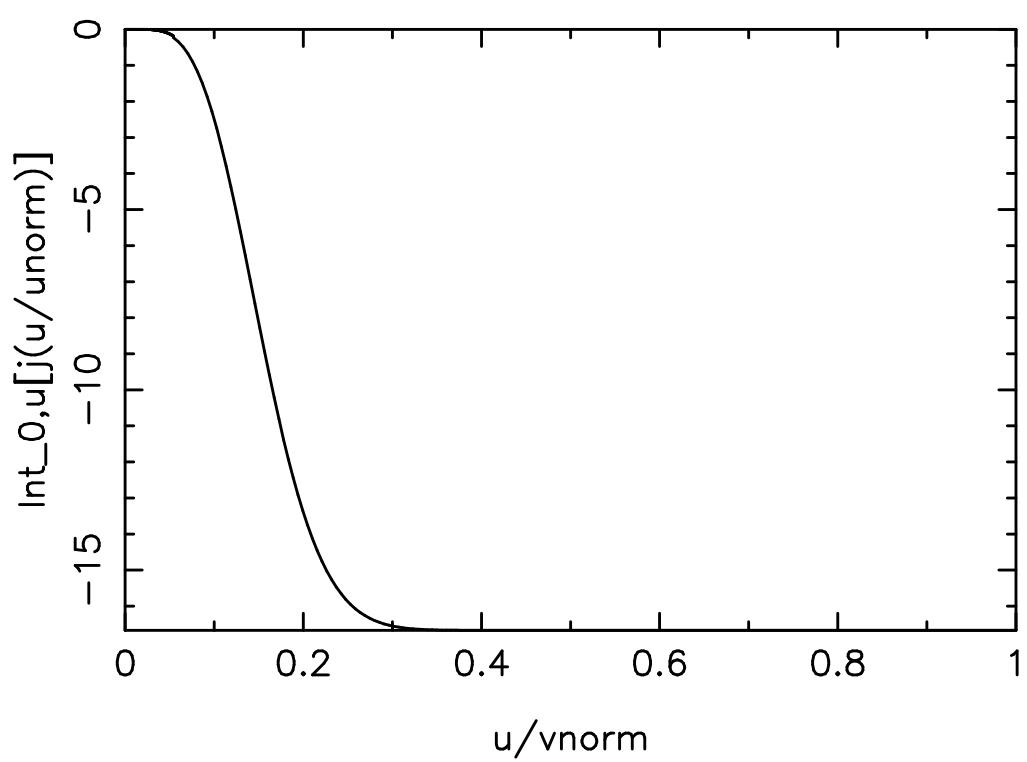
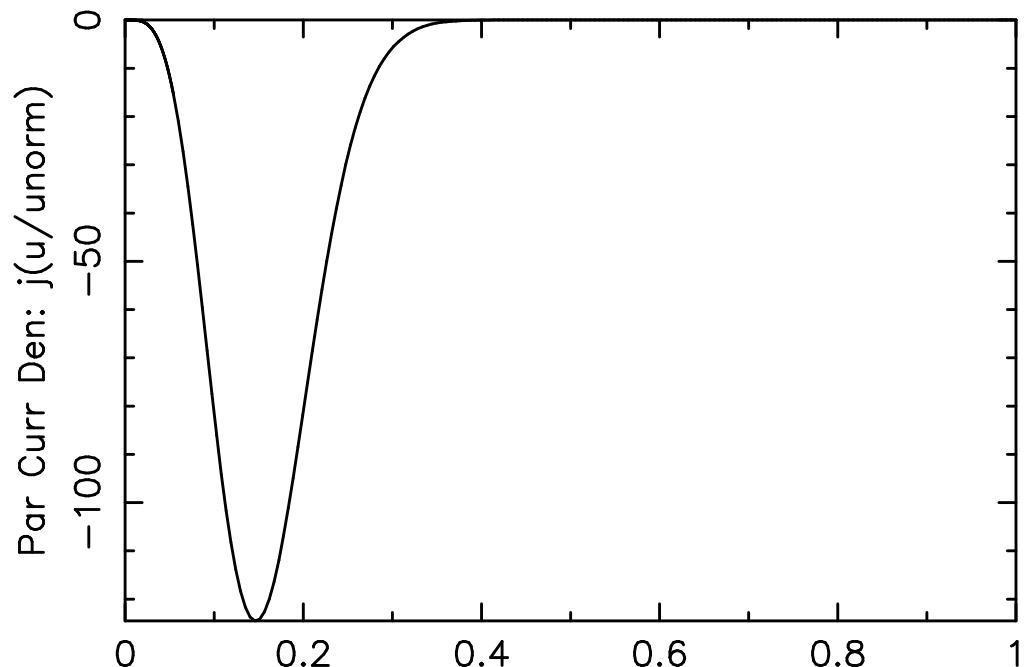
Species: 1 Power =0.1338E+01 Watts/cc



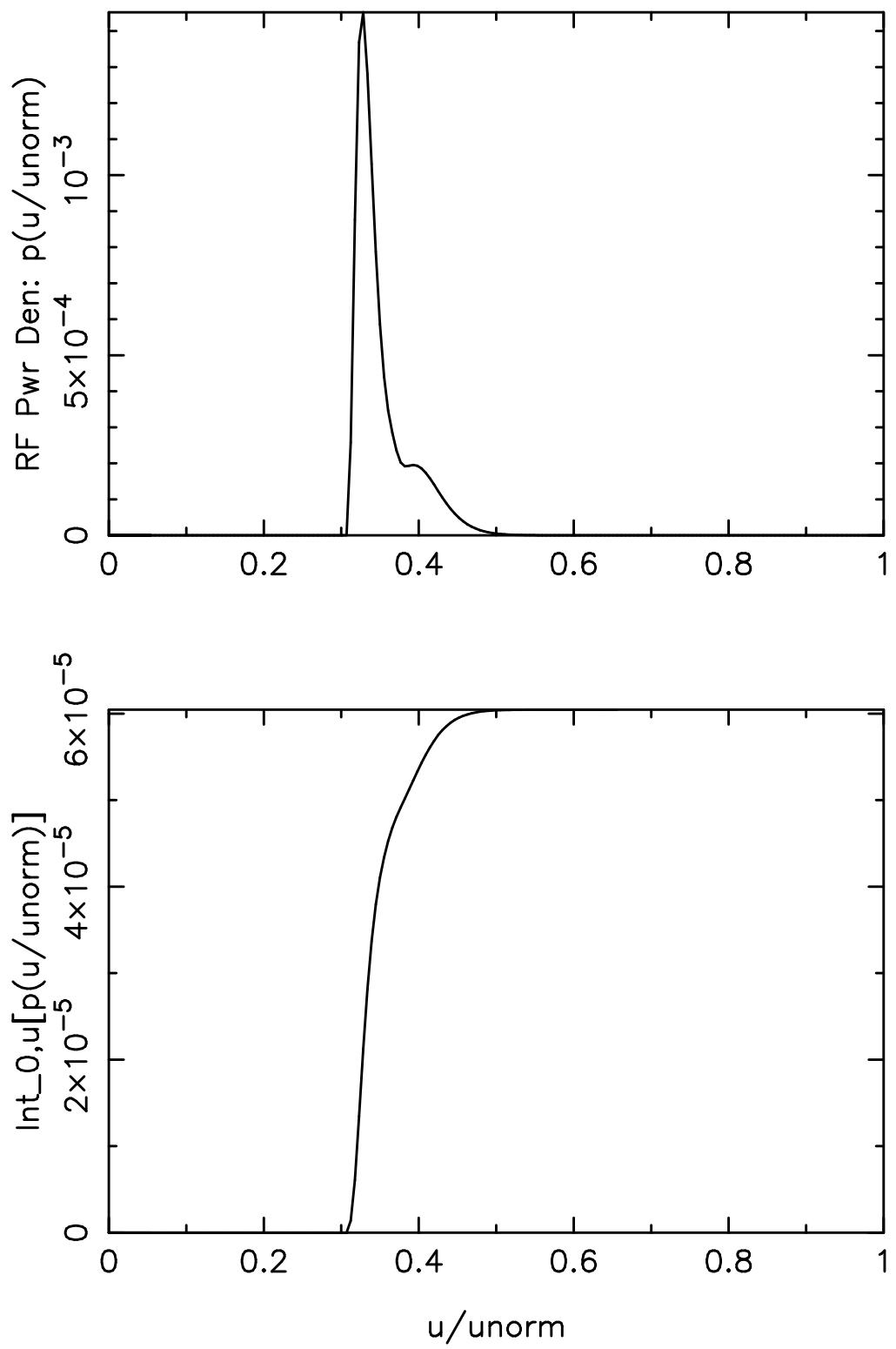
Electric field = 0.0000E+00 (V/cm)

FSA current den of species 2 = -1.6669E+01 Amps/cm**2

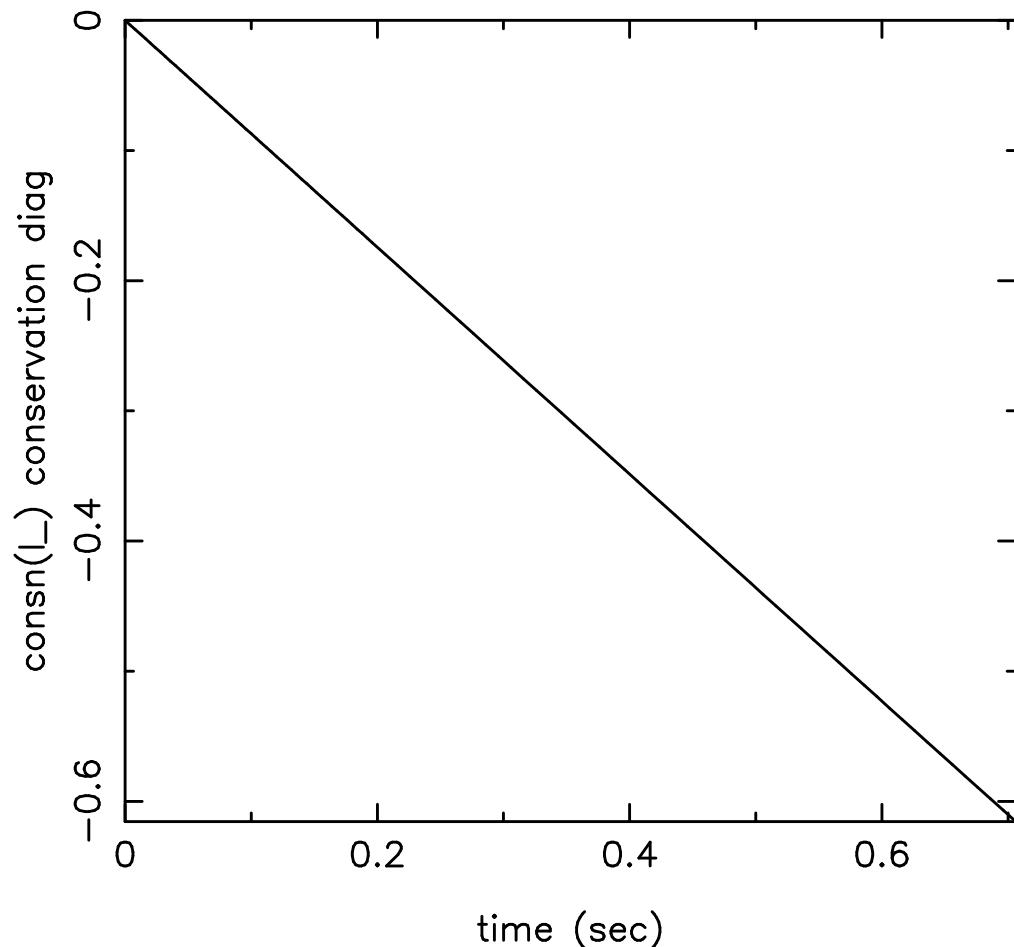
Current drive efficiency $j/(2\pi R \cdot prf)$ = -2.4705E+02 A/W
 Electron current (units $ne \cdot q \cdot v_{th}(kelec, lr_*)$) = -6.2278E-04
 power (units: $ne \cdot v_{th}(kelec, lr_*)^2 \cdot 2 \cdot me \cdot nu_0$) = 1.8852E-08
 efficiency (j/p) (Fisch 1978 units) = -3.3035E+04
 efficiency (j/p) ($e/(m \cdot c \cdot nu_c)$ units) = -2.8648E+02
 $v_{th}(kelec, lr_*) = \sqrt{T/m}$ = 2.7918E+09 cm/sec
 $nu_0 = 7.5417E+04$ Hz



Species: 2 Current =-.1667E+02 Amps/cm²



Species: 2 Power = $0.6046\text{E}-04$ Watts/cc

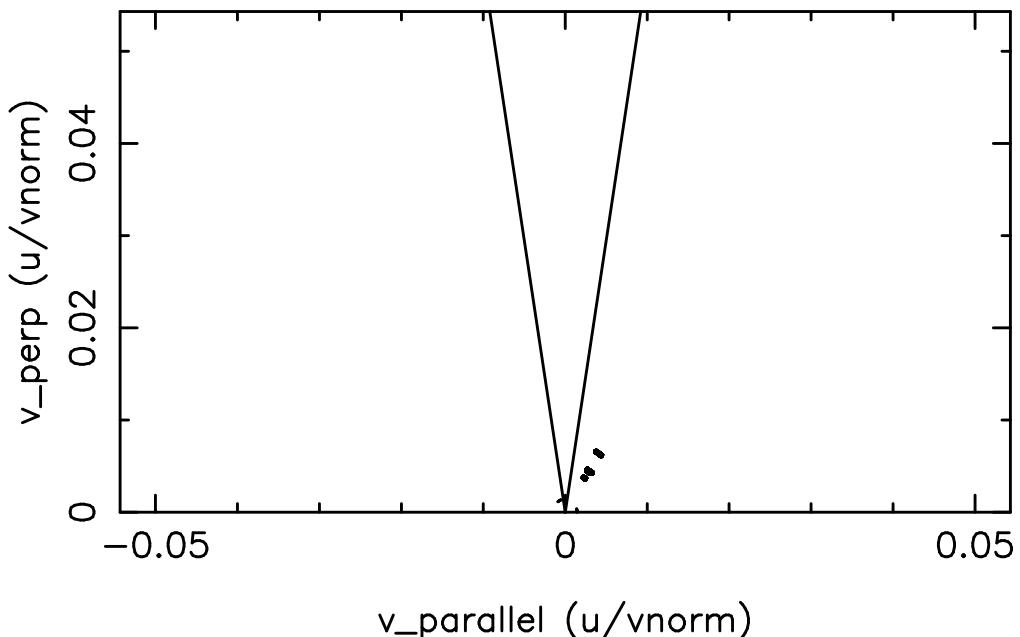


consn(l_)= -6.1545E-01

Perfect conservation should yield machine accuracy,
or about 1.e-14:

time step (n) is 100 time= 7.0600E-01 secs
r/a= 3.7755E-02 radial position (R) = 1.8022E+02 cm

Species 1 Source Function (units: dist. f/sec)



time step n= 100 time= 7.06E-01 secs
 $r/a = 3.776E-02$ radial position (R)= 1.8022E+02 cm
 $rya = 3.776E-02$ R=rpcon= 1.8022E+02 cm, Surf# 5

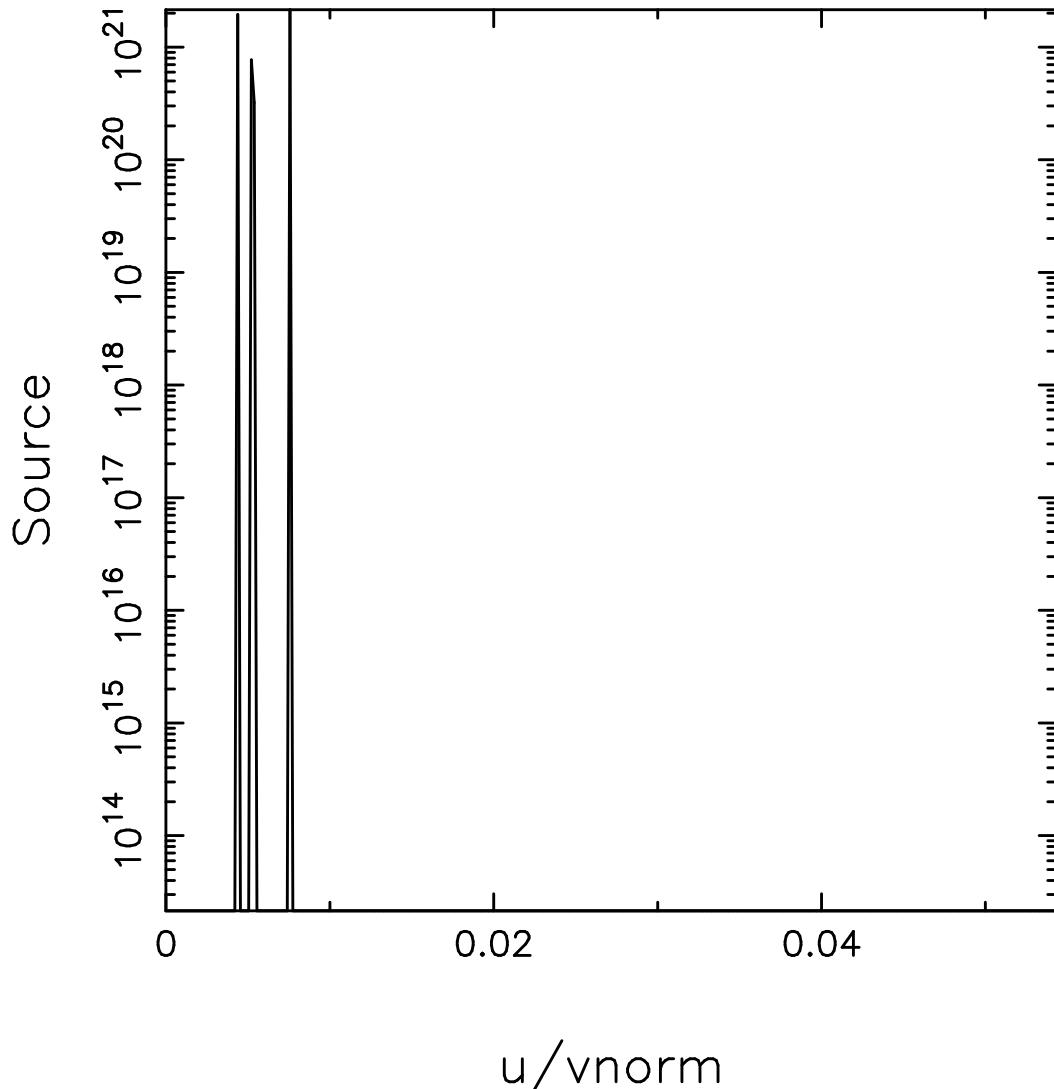
Particle source rate= 1.0447E+14 ptcls/cc/sec

Total source power [entr(..5..)]= 1.0764E+00 W/cc

Contour values:

| | | | |
|------------|------------|------------|------------|
| 4.7943E+10 | 1.9086E+11 | 7.5984E+11 | 3.0250E+12 |
| 1.2043E+13 | 4.7943E+13 | 1.9086E+14 | 7.5984E+14 |
| 3.0250E+15 | 1.2043E+16 | 4.7943E+16 | 1.9086E+17 |
| 7.5984E+17 | 3.0250E+18 | 1.2043E+19 | 4.7943E+19 |
| 1.9086E+20 | 7.5984E+20 | 3.0250E+21 | 1.2043E+22 |

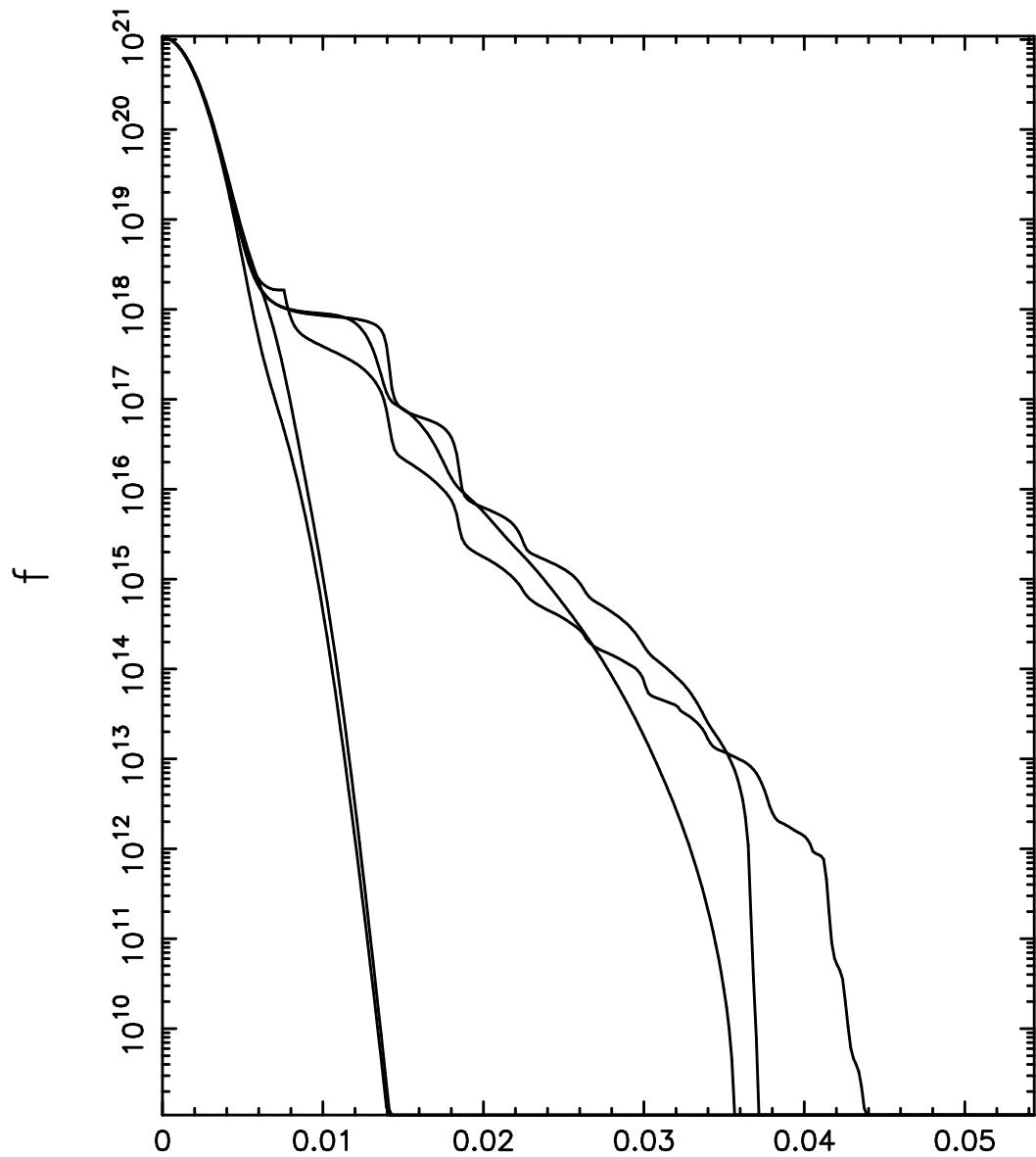
Pitch Angle Avg Source vs. u



Particle source integrated over theta0 for species 1
(normed so int(0,1)*2pi*x**2*dx=mid-plane source)
vnorm= 3.6947E+10 cm/s

time step (n) is 100 time= 7.0600E-01 secs
r/a= 3.7755E-02 radial position (R) = 1.8022E+02 cm

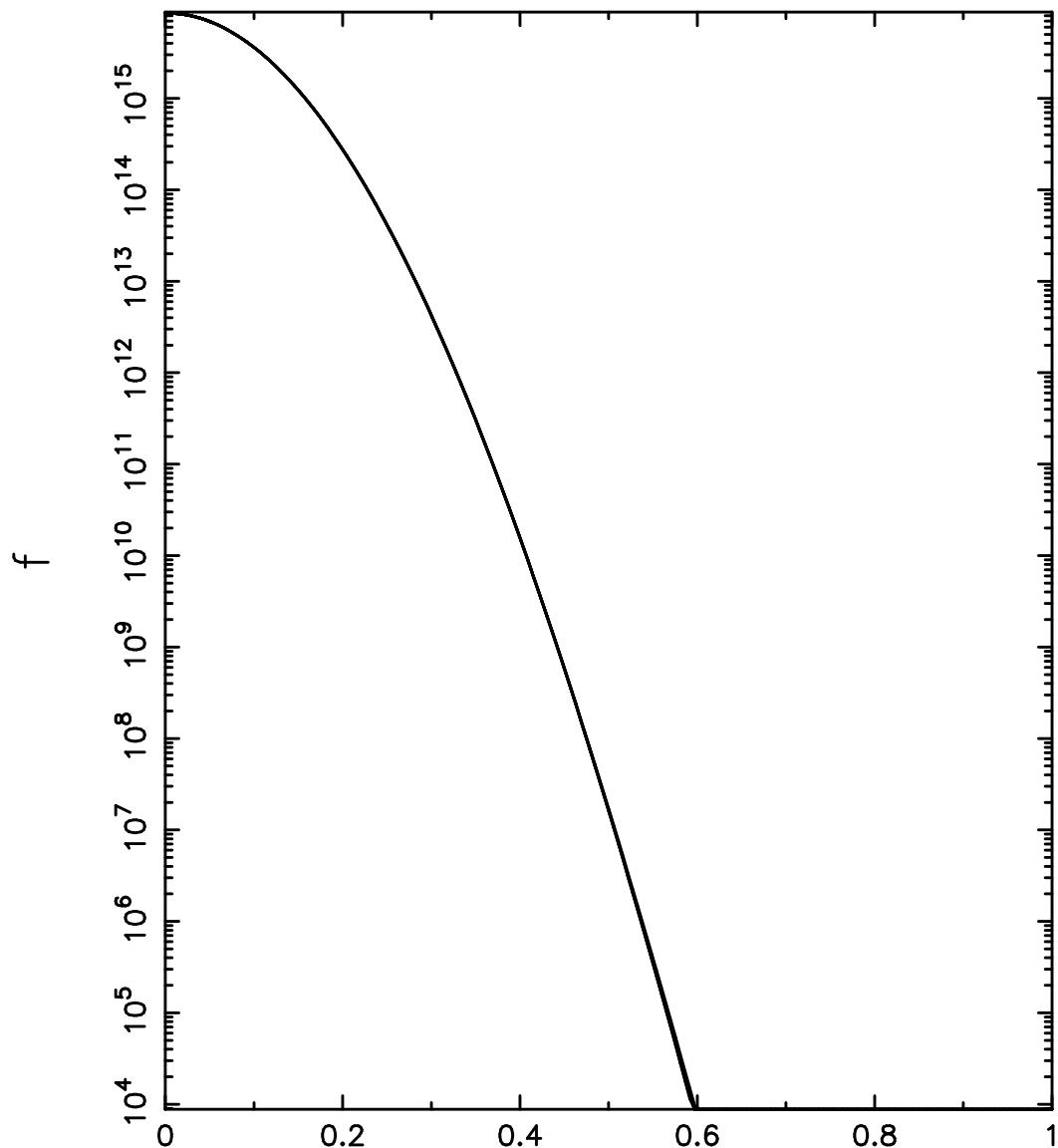
Cuts of f vs. v , at cnst pitch angle



u/v_{norm}

Distribution function vs. velocity for some angles
Species number=1, enorm= 3.00D+02
time step (n)= 100 time= 0.706000E+00 secs
r/a= 3.78E-02 radial position(R)= 1.802E+02 cm

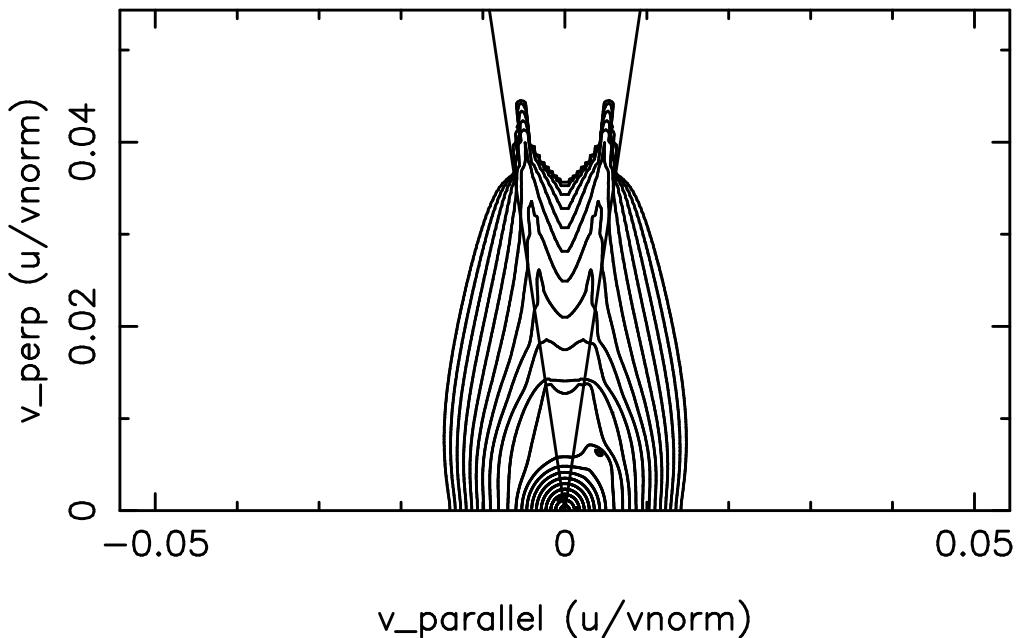
Cuts of f vs. v , at cnst pitch angle



u/v_{norm}

Distribution function vs. velocity for some angles
Species number=2, enorm= 3.00D+02
time step (n)= 100 time= 0.706000E+00 secs
r/a= 3.78E-02 radial position(R)= 1.802E+02 cm

Species 1 Distribution Function Contour Plot

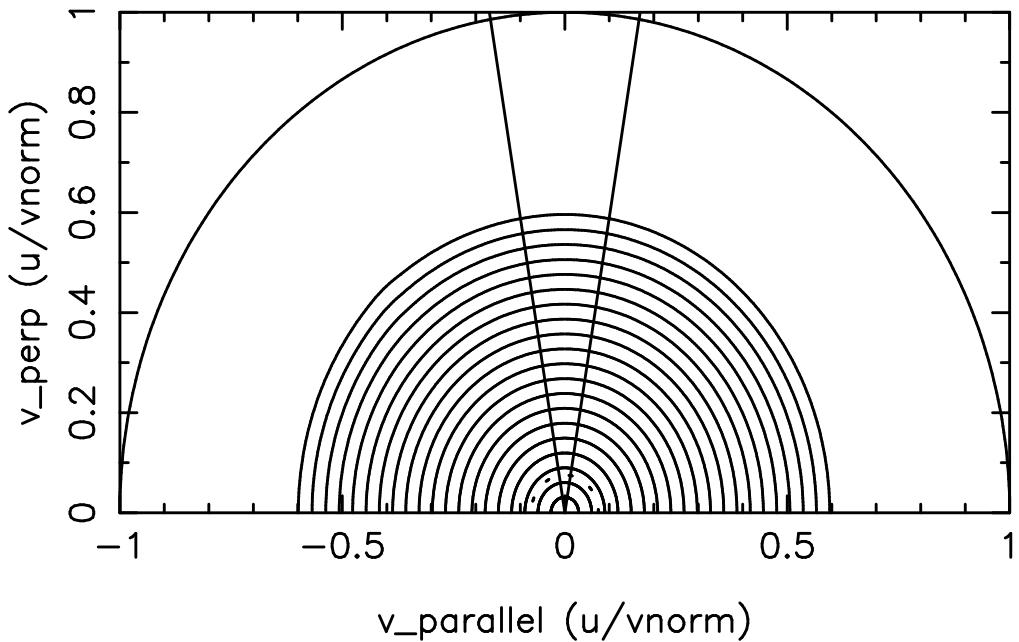


time step n= 100 time= 7.06E-01 secs
 $r/a = 3.776E-02$ radial position (R)= 1.8022E+02 cm
 $rya = 3.776E-02$ R=rpcon= 1.8022E+02 cm, Surf# 5

Contour values:

| | | | |
|--------------|--------------|--------------|--------------|
| 9.809059E+20 | 7.717757E+20 | 5.182831E+20 | 2.977087E+20 |
| 1.467034E+20 | 6.224367E+19 | 2.283534E+19 | 7.278695E+18 |
| 2.026244E+18 | 4.953568E+17 | 1.069606E+17 | 2.051901E+16 |
| 3.517896E+15 | 5.422019E+14 | 7.556324E+13 | 9.576208E+12 |
| 1.109676E+12 | 1.181997E+11 | 1.163197E+10 | 1.062683E+09 |

Species 2 Distribution Function Contour Plot



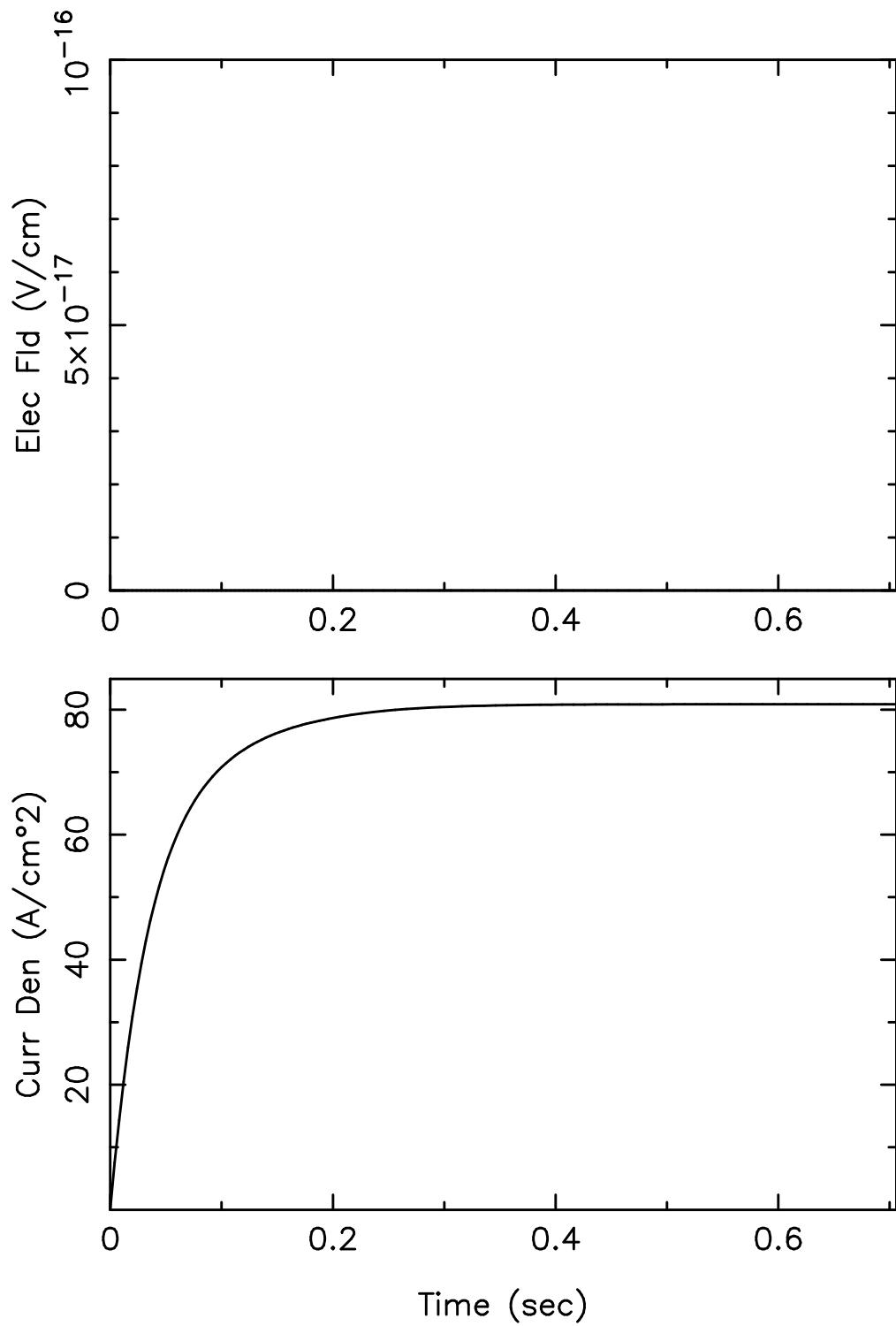
time step n= 100 time= 7.06E-01 secs
 $r/a = 3.776E-02$ radial position (R)= 1.8022E+02 cm
 $rya = 3.776E-02$ R=rpcon= 1.8022E+02 cm, Surf# 5

Contour values:

| | | | |
|--------------|--------------|--------------|--------------|
| 7.914864E+15 | 6.278115E+15 | 4.271549E+15 | 2.496735E+15 |
| 1.256310E+15 | 5.456249E+14 | 2.051671E+14 | 6.702951E+13 |
| 1.910102E+13 | 4.767602E+12 | 1.046944E+12 | 2.032055E+11 |
| 3.502677E+10 | 5.387849E+09 | 7.431768E+08 | 9.237085E+07 |
| 1.039506E+07 | 1.064180E+06 | 9.956352E+04 | 8.551188E+03 |

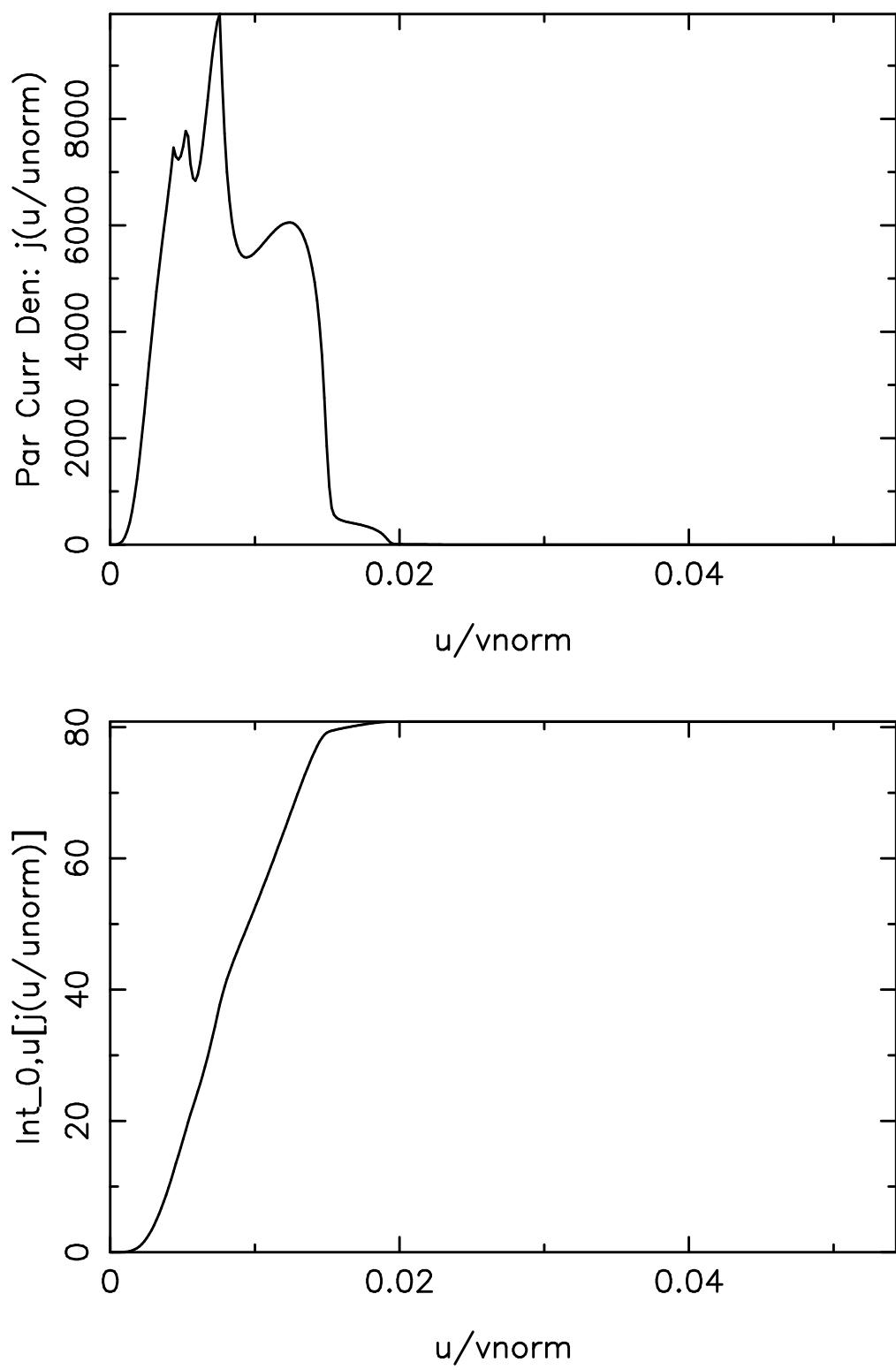
LOCAL RADIAL QUANTITIES

```
time step n= 100,      time= 7.0600E-01 secs
flux surf= 7      total flux surfs= 65
r/a= 5.163E-02      radial position (R)= 1.8112E+02 cms
rya= 5.163E-02      R=rpcon= 1.811E+02 cm
enormi, enorme(=enorm) (kev) = 3250.000      300.000
vnorm/c = 1.2324136
vthe (sqrt(te/me))/c = 0.0930203
vthe/vnorm = 0.0754782
k= 1 vth(k)/vnorm = 0.0014386
k= 2 vth(k)/vnorm = 0.0754782
k= 3 vth(k)/vnorm = 0.0014386
k= 4 vth(k)/vnorm = 0.0001437
k= 5 vth(k)/vnorm = 0.0754782
```

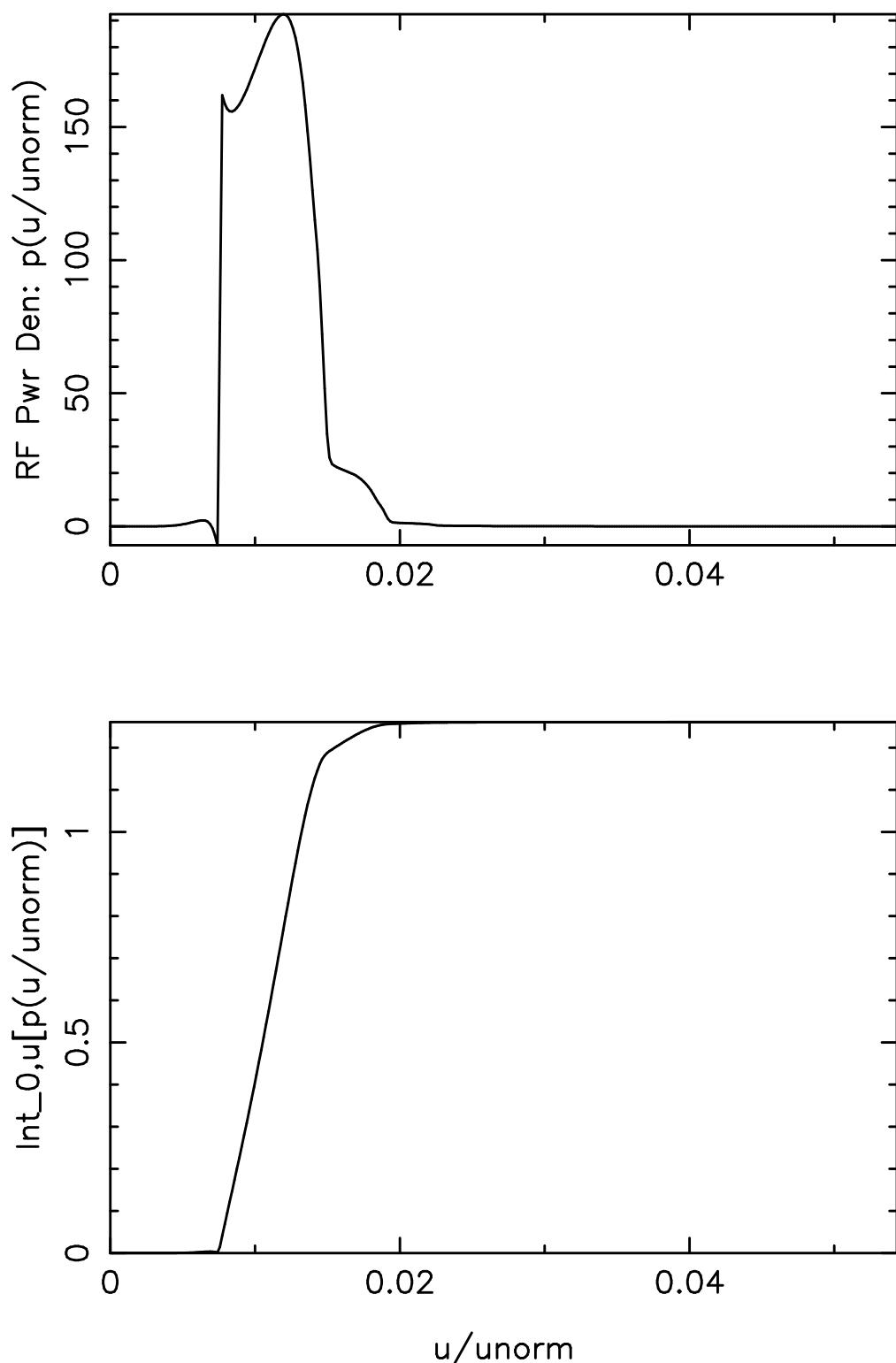


Electric field = 0.0000E+00 (V/cm)
FSA current den of species 1 = 8.0852E+01 Amps/cm**2

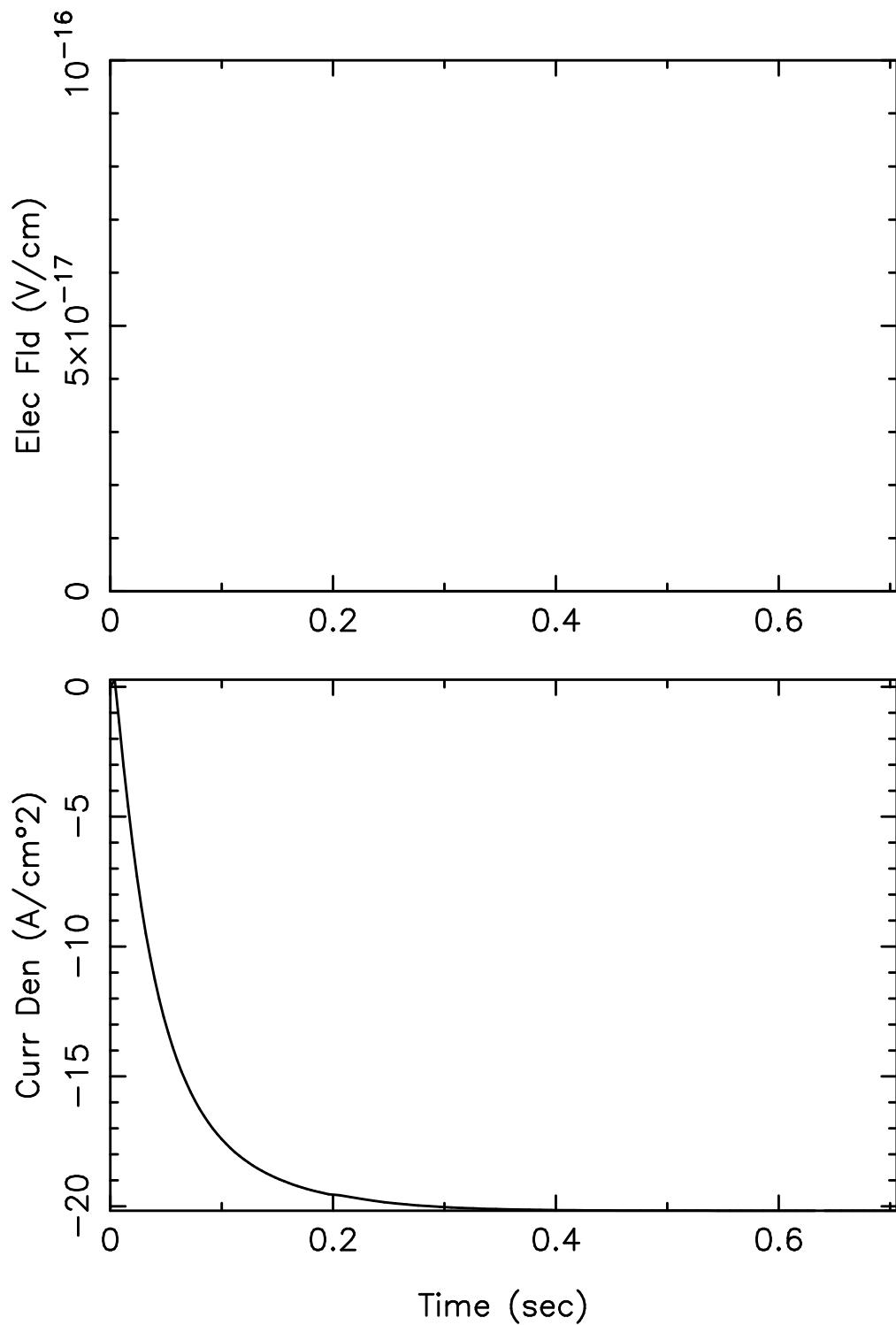
Current drive efficiency $j/(2\pi R \rho r_f)$ = 5.7492E-02 A/W



Species: 1 Current = 0.8085E+02 Amps/cm²

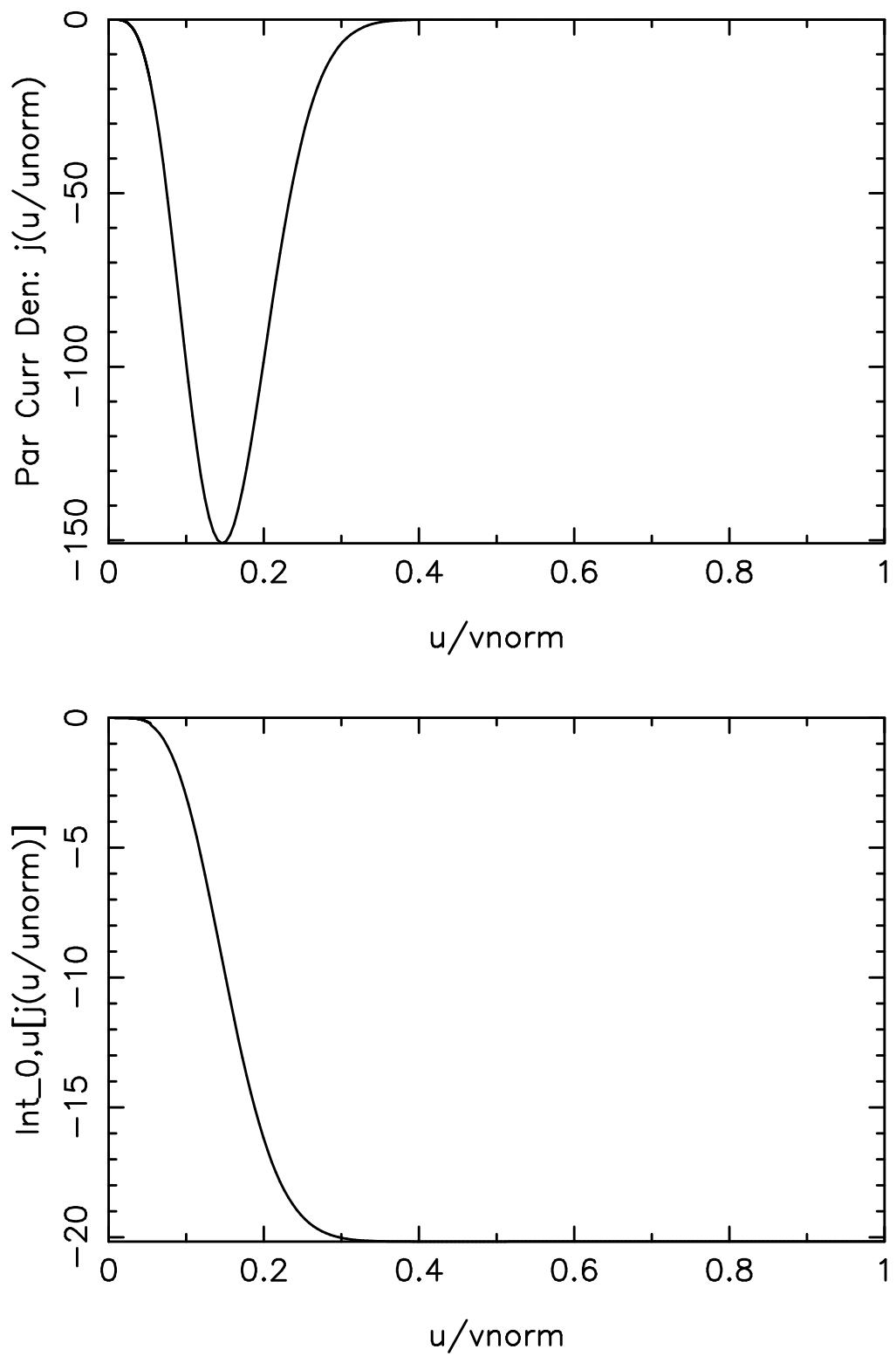


Species: 1 Power =0.1261E+01 Watts/cc

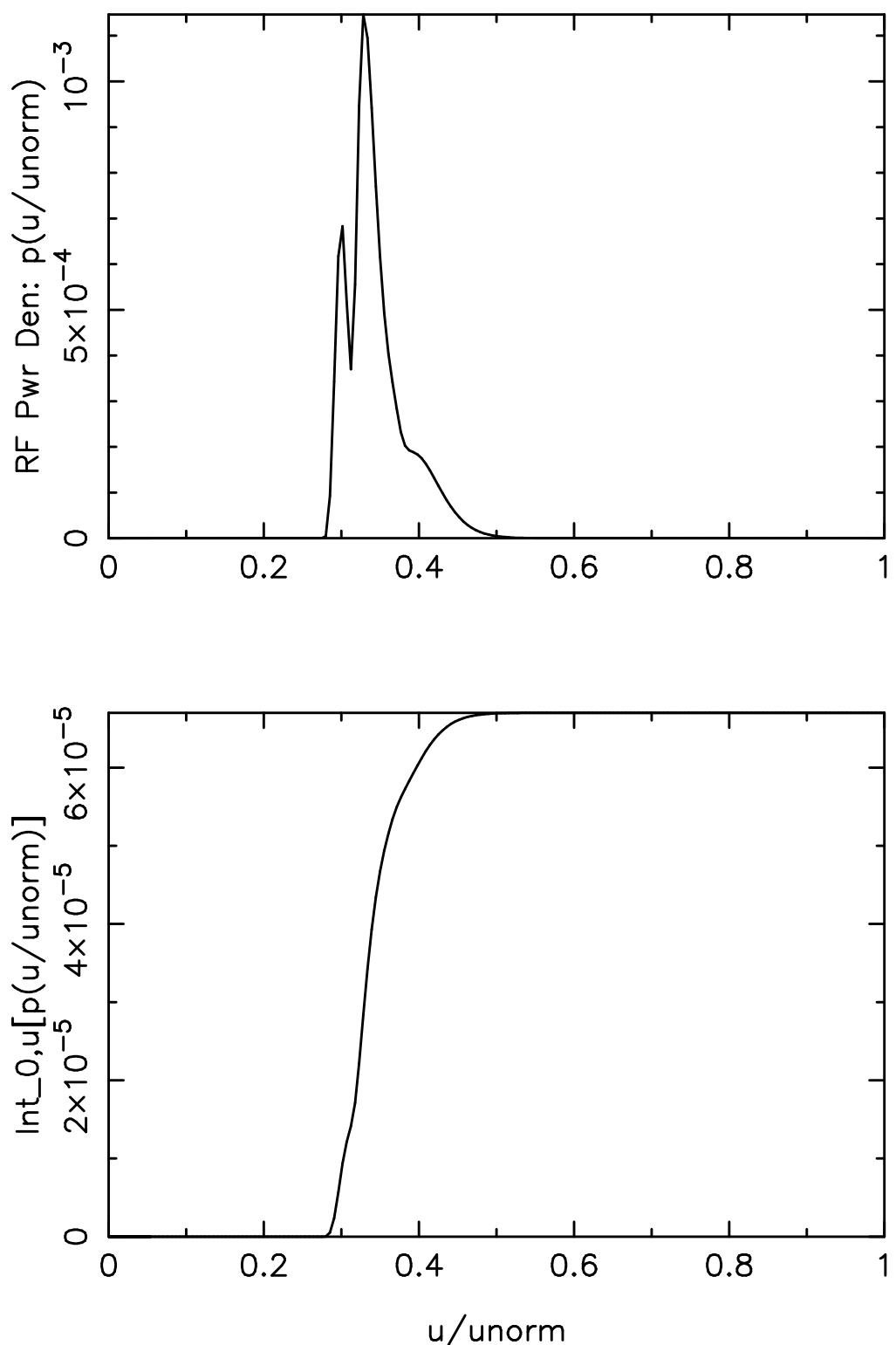


Electric field = 0.0000E+00 (V/cm)
 FSA current den of species 2 = -2.0167E+01 Amps/cm**2

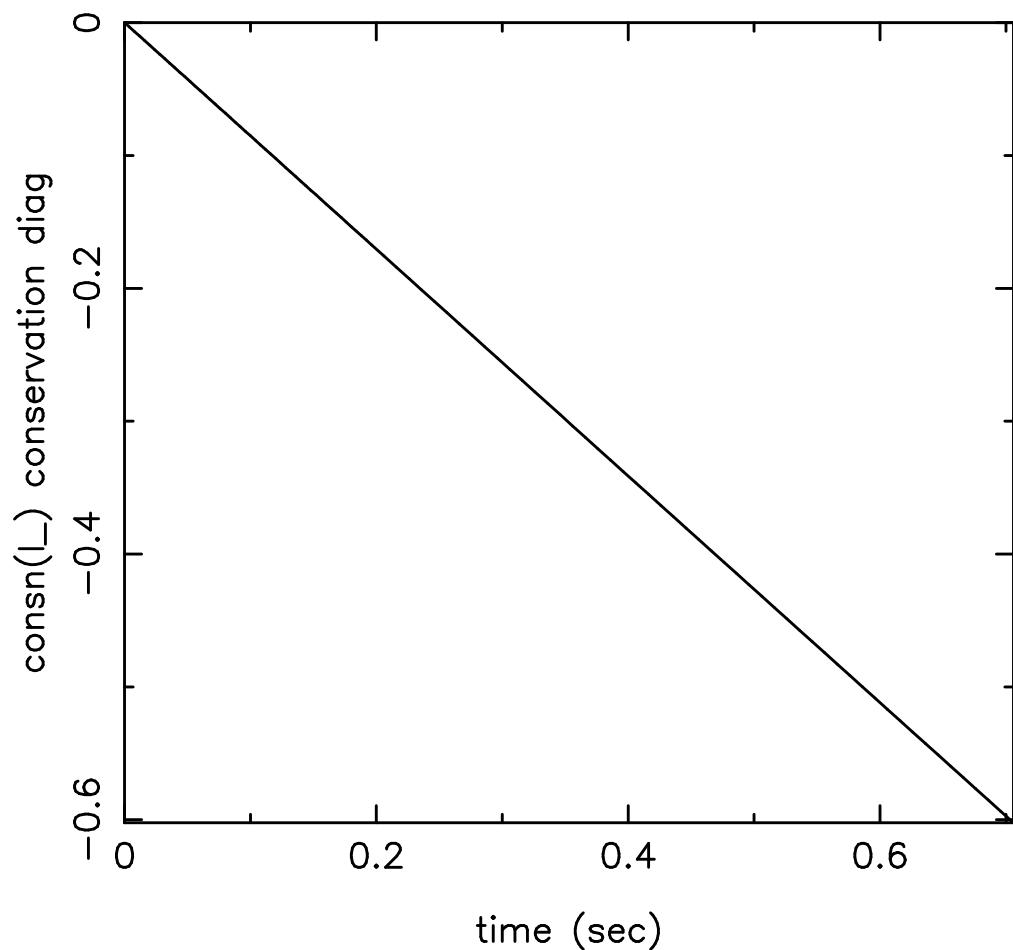
Current drive efficiency $j/(2\pi R \cdot prf)$ = -2.6976E+02 A/W
 Electron current (units $ne \cdot q \cdot v_{th}(kelec, lr_*)$) = -7.5560E-04
 power (units: $ne \cdot v_{th}(kelec, lr_*)^2 \cdot me \cdot nu_0$) = 2.0944E-08
 efficiency (j/p) (Fisch 1978 units) = -3.6077E+04
 efficiency (j/p) ($e/(m \cdot c \cdot nu_c)$ units) = -3.1217E+02
 $v_{th}(kelec, lr_*) = \sqrt{T/m} = 2.7887E+09$ cm/sec
 $nu_0 = 7.5541E+04$ Hz



Species: 2 Current =-.2017E+02 Amps/cm²



Species: 2 Power = $0.6701\text{E}-04$ Watts/cc

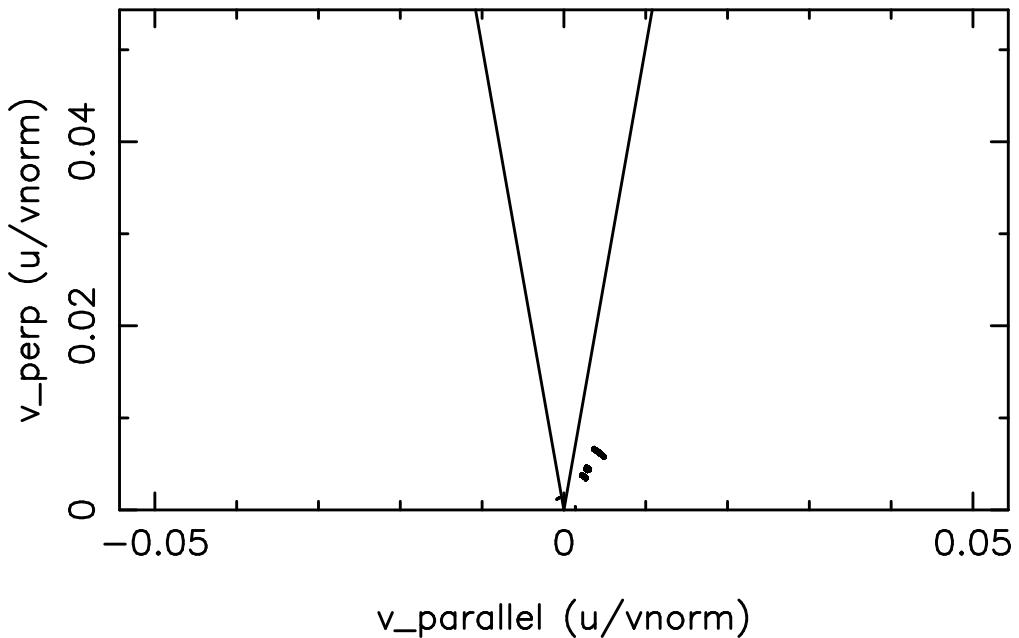


consn(l_)= -6.0233E-01

Perfect conservation should yield machine accuracy,
or about 1.e-14:

time step (n) is 100 time= 7.0600E-01 secs
r/a= 5.1633E-02 radial position (R) = 1.8112E+02 cm

Species 1 Source Function (units: dist. f/sec)



time step n= 100 time= 7.06E-01 secs
 $r/a = 5.163E-02$ radial position (R)= 1.8112E+02 cm
 $rya = 5.163E-02$ $R=rpcon= 1.8112E+02$ cm, Surf# 7

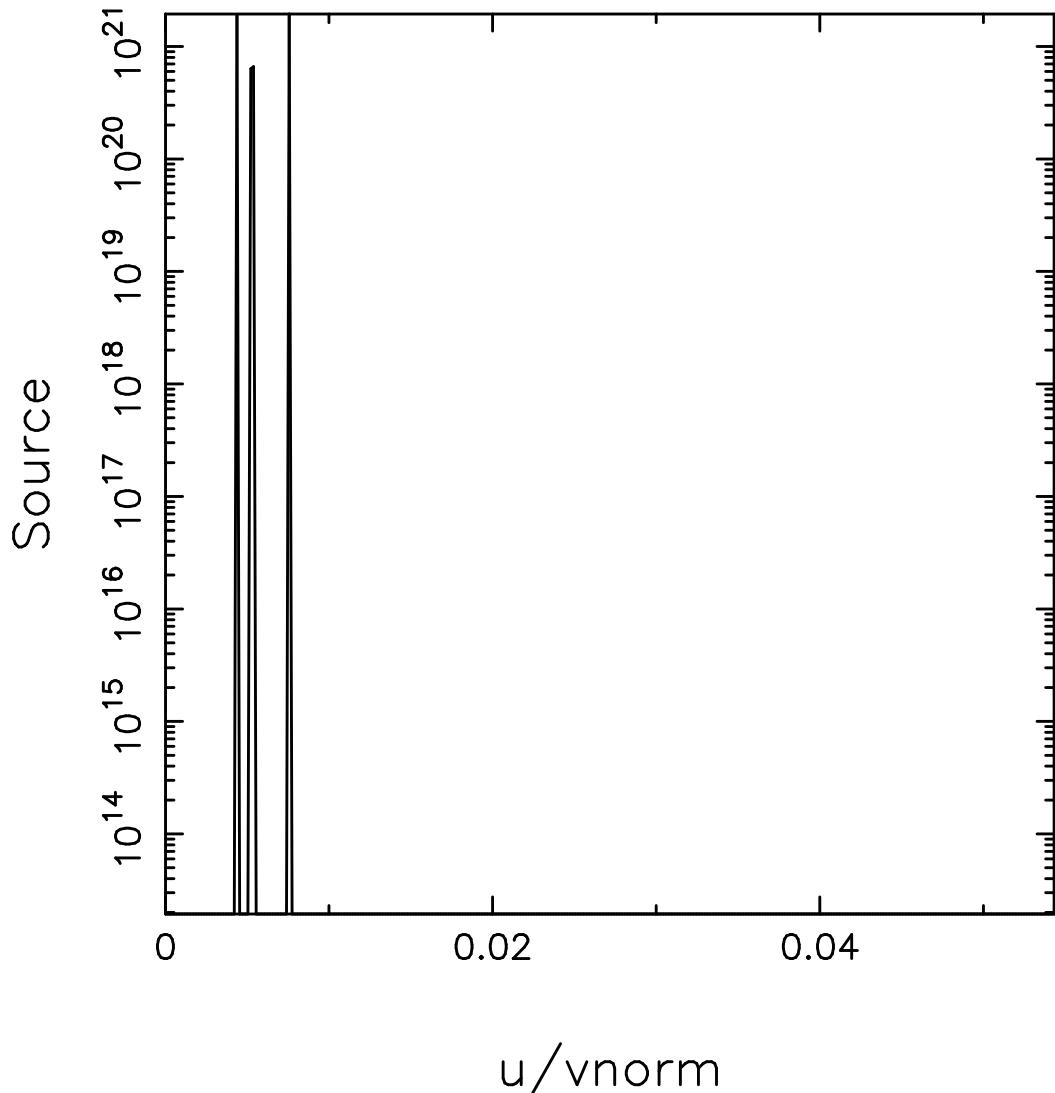
Particle source rate= 1.0203E+14 ptcls/cc/sec

Total source power [entr(..5..)]= 1.0235E+00 W/cc

Contour values:

| | | | |
|------------|------------|------------|------------|
| 3.6831E+10 | 1.4663E+11 | 5.8374E+11 | 2.3239E+12 |
| 9.2517E+12 | 3.6831E+13 | 1.4663E+14 | 5.8374E+14 |
| 2.3239E+15 | 9.2517E+15 | 3.6831E+16 | 1.4663E+17 |
| 5.8374E+17 | 2.3239E+18 | 9.2517E+18 | 3.6831E+19 |
| 1.4663E+20 | 5.8374E+20 | 2.3239E+21 | 9.2517E+21 |

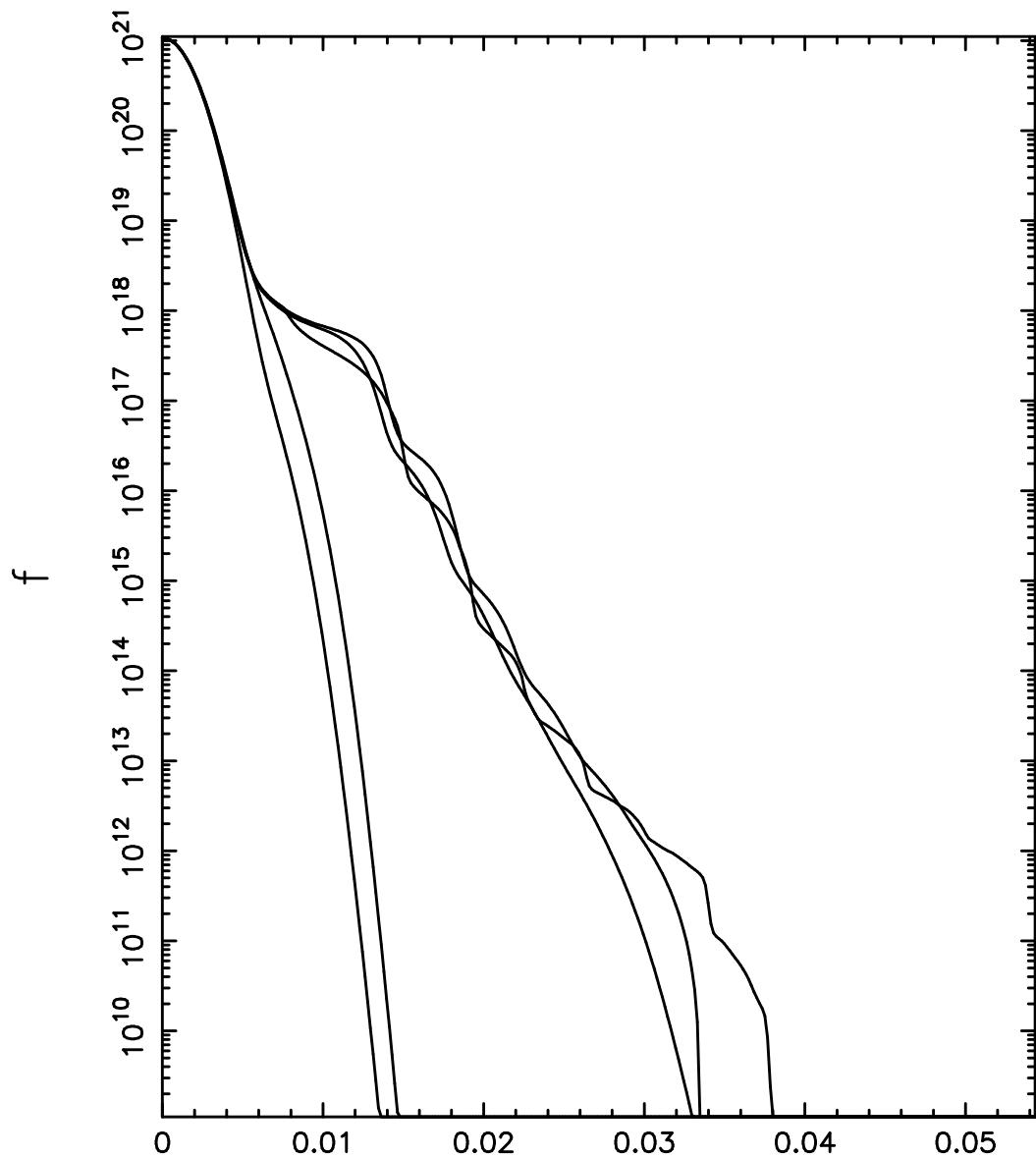
Pitch Angle Avg Source vs. u



Particle source integrated over theta0 for species 1
(normed so int(0,1)*2pi*x**2*dx=mid-plane source)
vnorm= 3.6947E+10 cm/s

time step (n) is 100 time= 7.0600E-01 secs
r/a= 5.1633E-02 radial position (R) = 1.8112E+02 cm

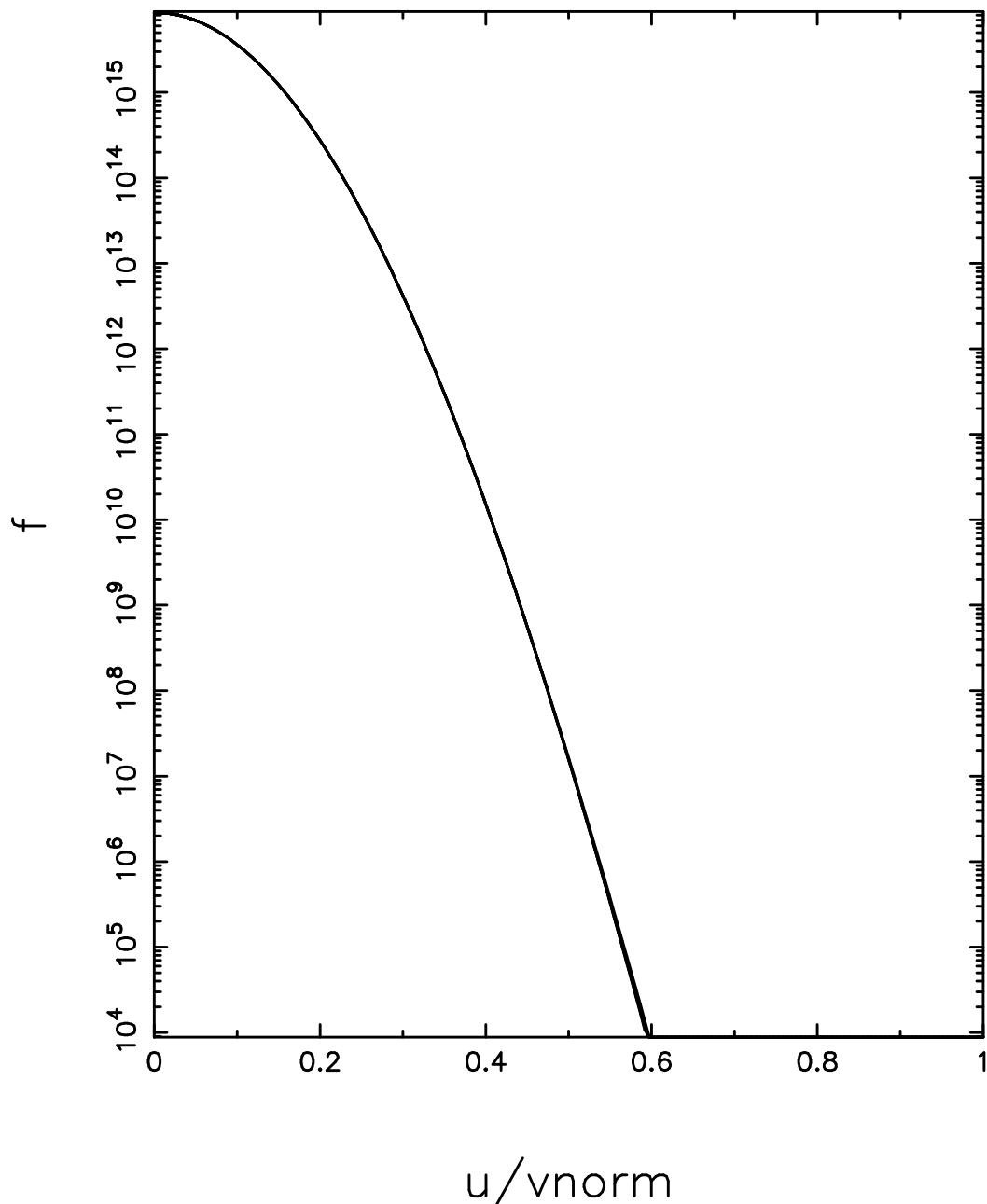
Cuts of f vs. v, at cnst pitch angle



u/v_{norm}

Distribution function vs. velocity for some angles
Species number=1, enorm= 3.00D+02
time step (n)= 100 time= 0.706000E+00 secs
 $r/a = 5.16E-02$ radial position(R)= 1.811E+02 cm

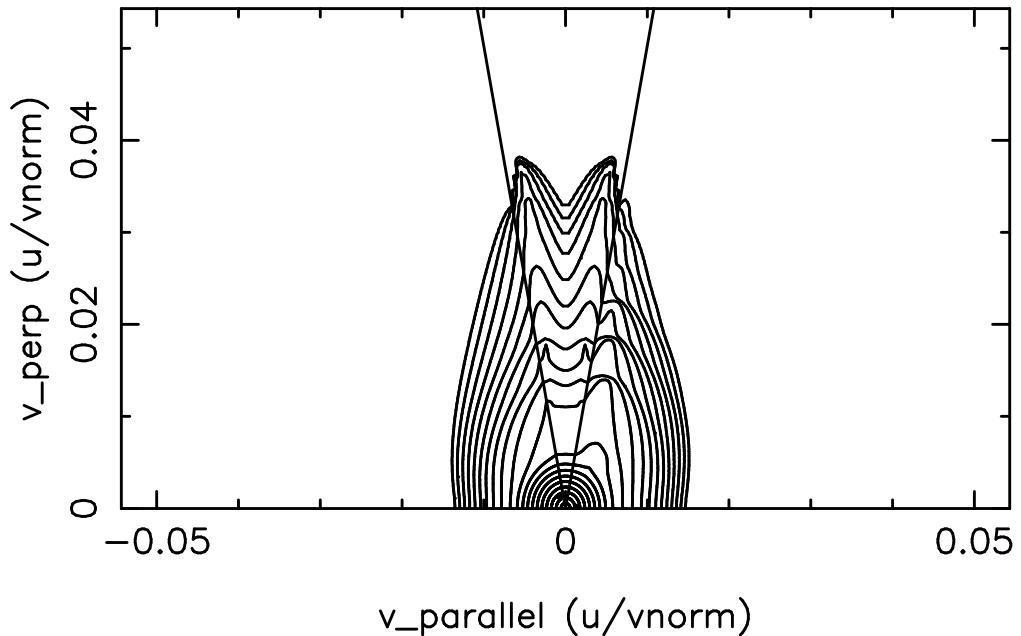
Cuts of f vs. v, at cnst pitch angle



u/v_{norm}

Distribution function vs. velocity for some angles
Species number=2, enorm= 3.00D+02
time step (n)= 100 time= 0.706000E+00 secs
r/a= 5.16E-02 radial position(R)= 1.811E+02 cm

Species 1 Distribution Function Contour Plot

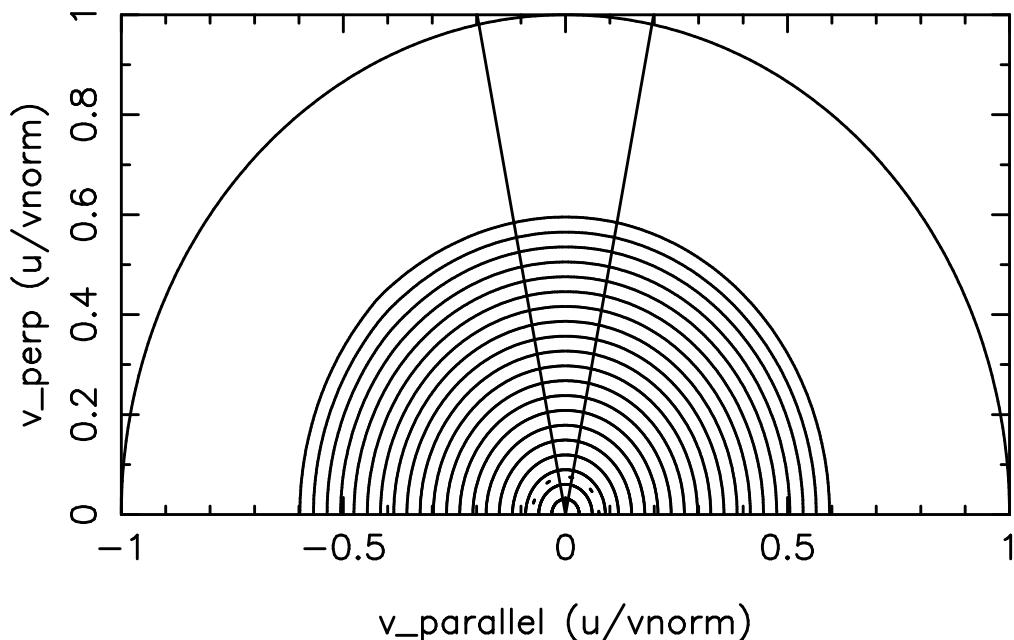


time step n= 100 time= 7.06E-01 secs
 $r/a = 5.163E-02$ radial position (R)= 1.8112E+02 cm
 $rya = 5.163E-02$ R=rpcon= 1.8112E+02 cm, Surf# 7

Contour values:

| | | | |
|--------------|--------------|--------------|--------------|
| 9.946757E+20 | 7.826661E+20 | 5.256573E+20 | 3.019909E+20 |
| 1.488409E+20 | 6.316346E+19 | 2.317775E+19 | 7.389409E+18 |
| 2.057476E+18 | 5.030803E+17 | 1.086435E+17 | 2.084382E+16 |
| 3.573722E+15 | 5.507927E+14 | 7.675318E+13 | 9.725338E+12 |
| 1.126671E+12 | 1.199693E+11 | 1.180108E+10 | 1.077574E+09 |

Species 2 Distribution Function Contour Plot



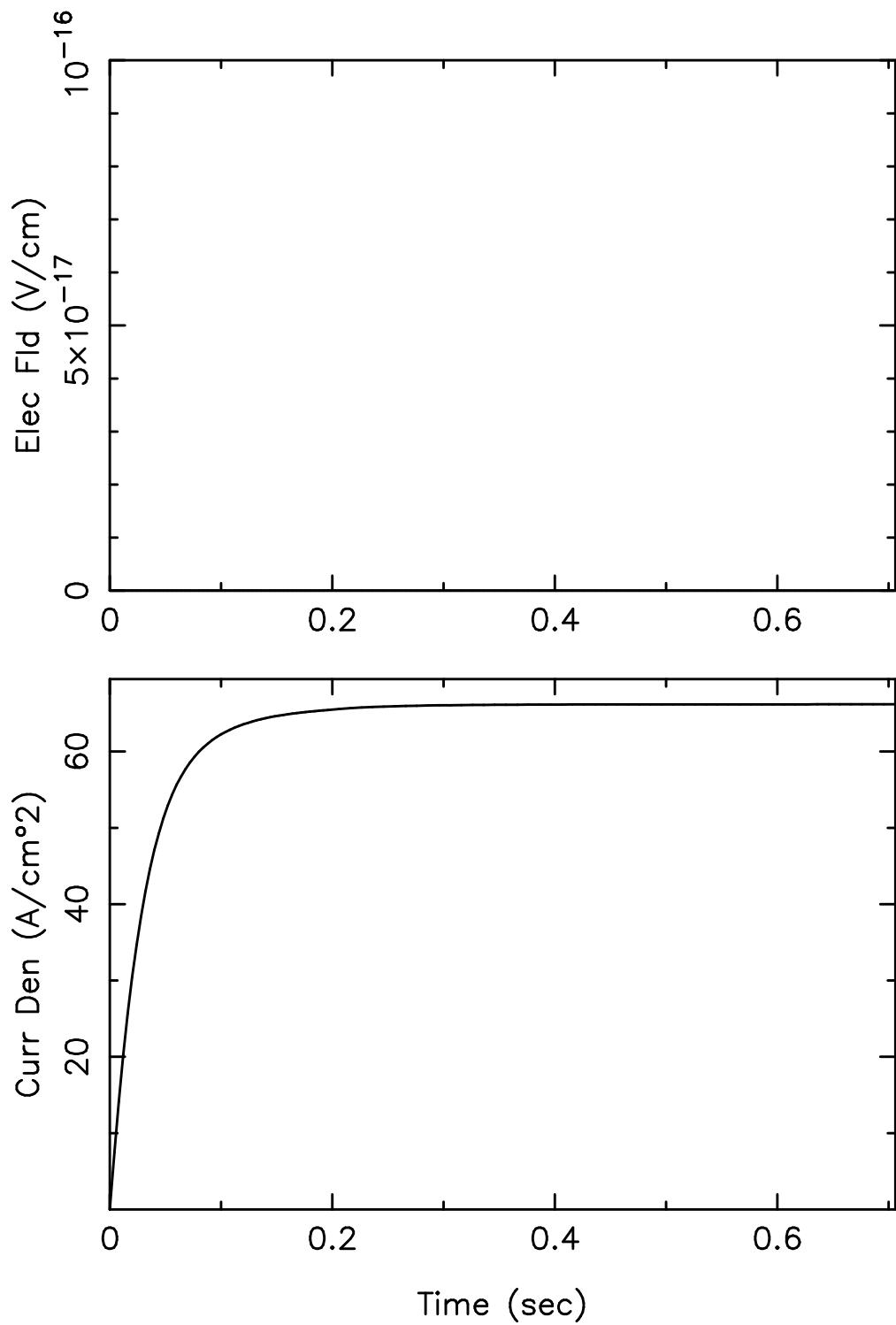
time step n= 100 time= 7.06E-01 secs
 $r/a = 5.163E-02$ radial position (R)= 1.8112E+02 cm
 $rya = 5.163E-02$ R=rpcon= 1.8112E+02 cm, Surf# 7

Contour values:

| | | | |
|--------------|--------------|--------------|--------------|
| 7.930346E+15 | 6.290735E+15 | 4.280510E+15 | 2.502264E+15 |
| 1.259269E+15 | 5.469962E+14 | 2.057172E+14 | 6.722059E+13 |
| 1.915856E+13 | 4.782658E+12 | 1.050376E+12 | 2.038890E+11 |
| 3.514610E+10 | 5.406164E+09 | 7.456543E+08 | 9.266680E+07 |
| 1.042628E+07 | 1.067084E+06 | 9.979993E+04 | 8.567757E+03 |

LOCAL RADIAL QUANTITIES

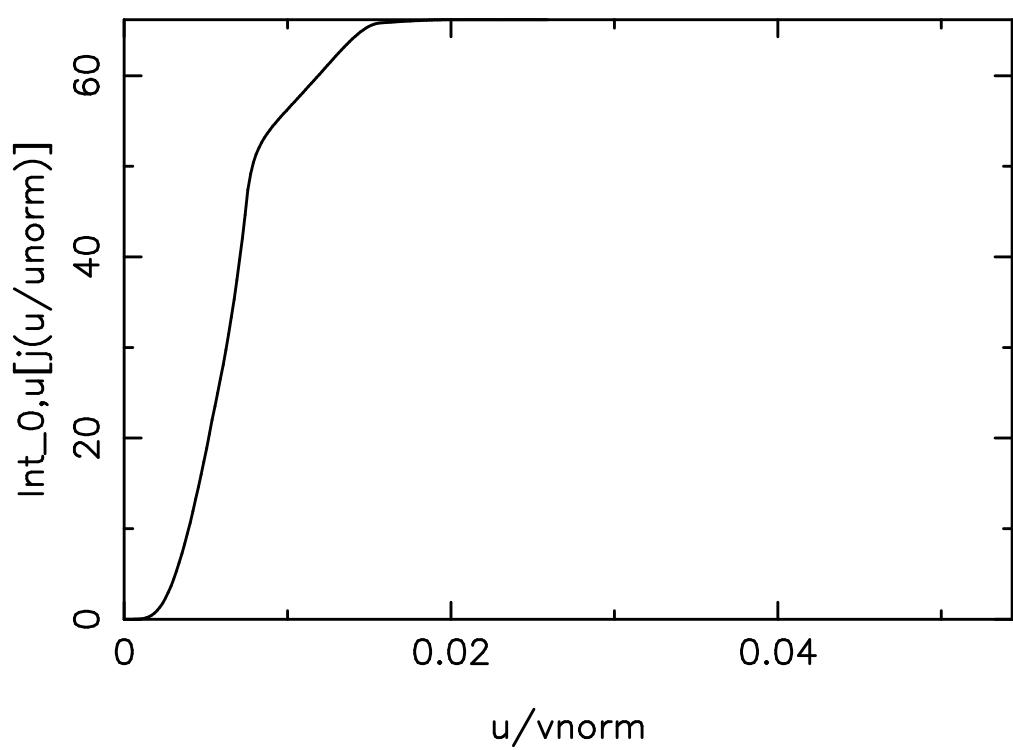
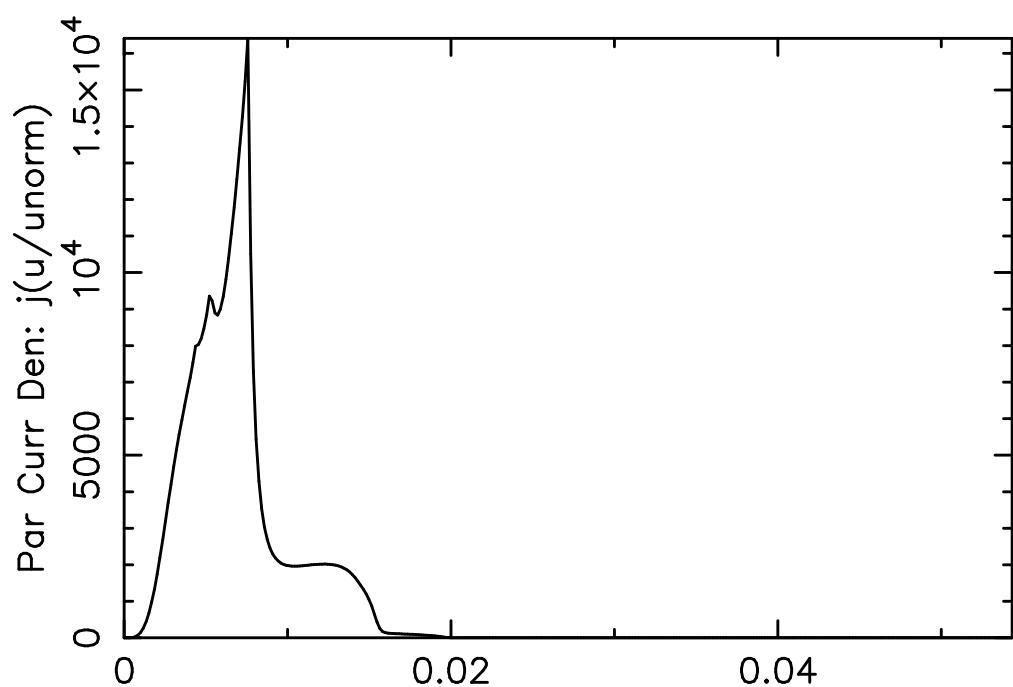
time step n= 100, time= 7.0600E-01 secs
flux surf= 8 total flux surfs= 65
r/a= 5.857E-02 radial position (R)= 1.8156E+02 cms
rya= 5.857E-02 R=rpcon= 1.816E+02 cm
enormi, enorme(=enorm) (kev) = 3250.000 300.000
vnorm/c = 1.2324136
vthe (sqrt(te/me))/c = 0.0929568
vthe/vnorm = 0.0754266
k= 1 vth(k)/vnorm = 0.0014376
k= 2 vth(k)/vnorm = 0.0754266
k= 3 vth(k)/vnorm = 0.0014376
k= 4 vth(k)/vnorm = 0.0001436
k= 5 vth(k)/vnorm = 0.0754266



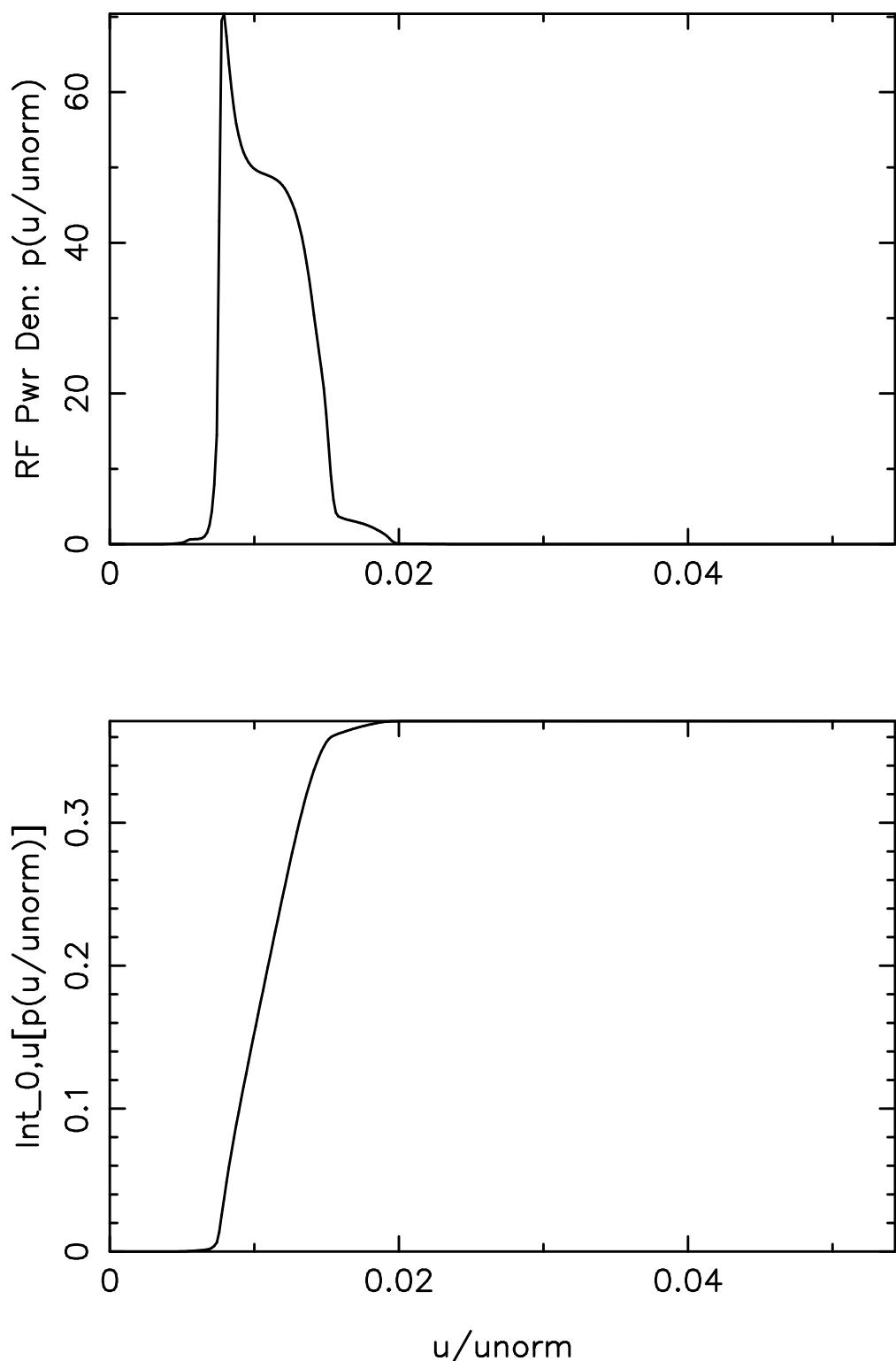
Electric field = 0.0000E+00 (V/cm)

FSA current den of species 1 = 6.6187E+01 Amps/cm**2

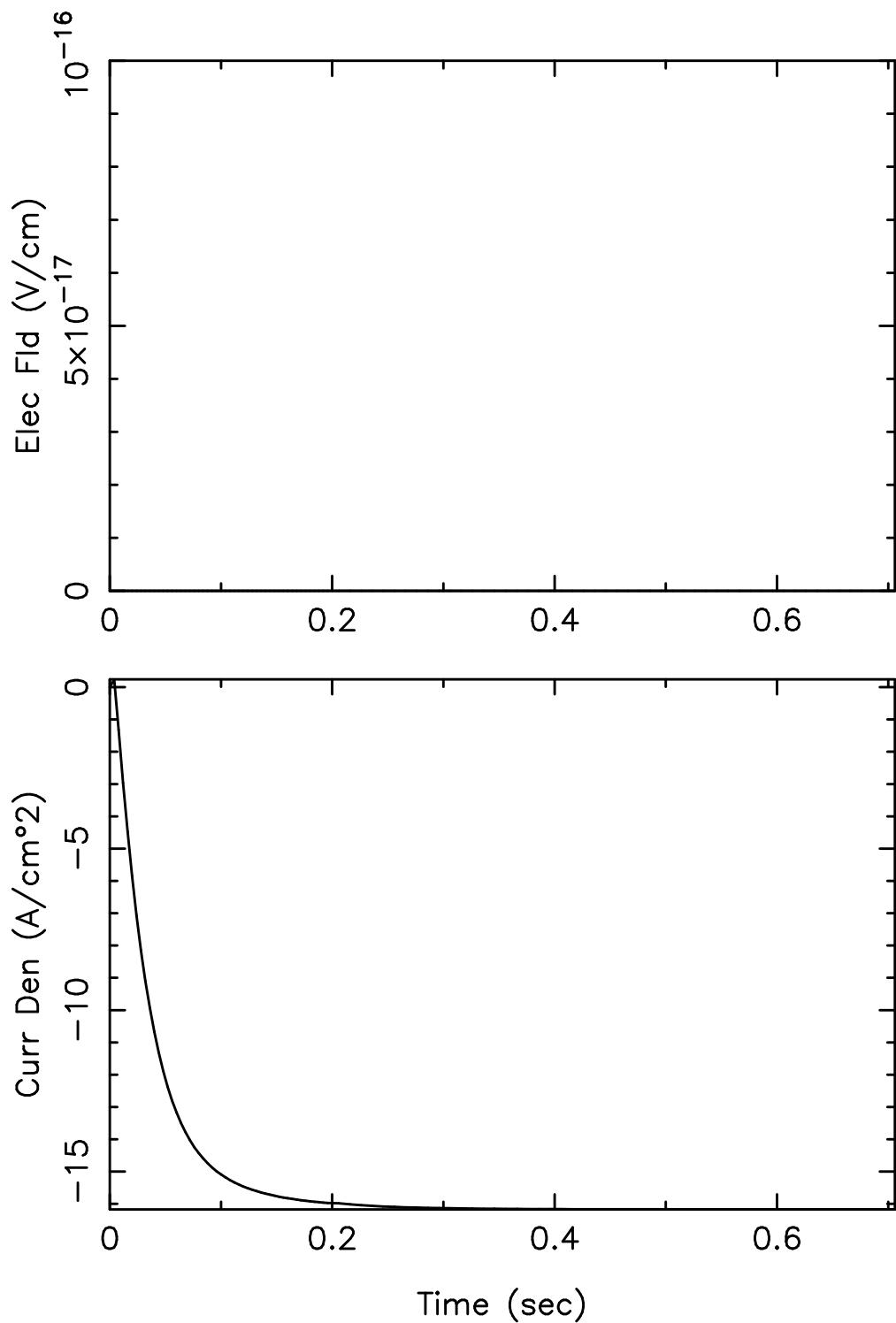
Current drive efficiency $j/(2\pi R \rho r_f)$ = 1.5985E-01 A/W



Species: 1 Current = 0.6619×10^2 Amps/cm 2

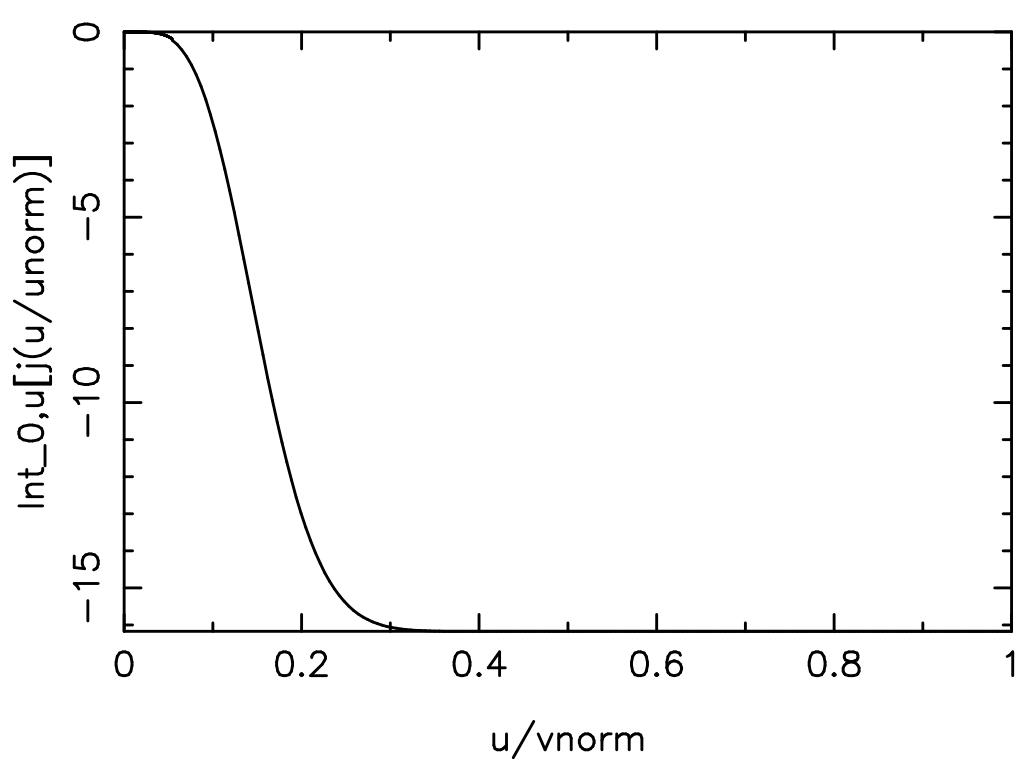
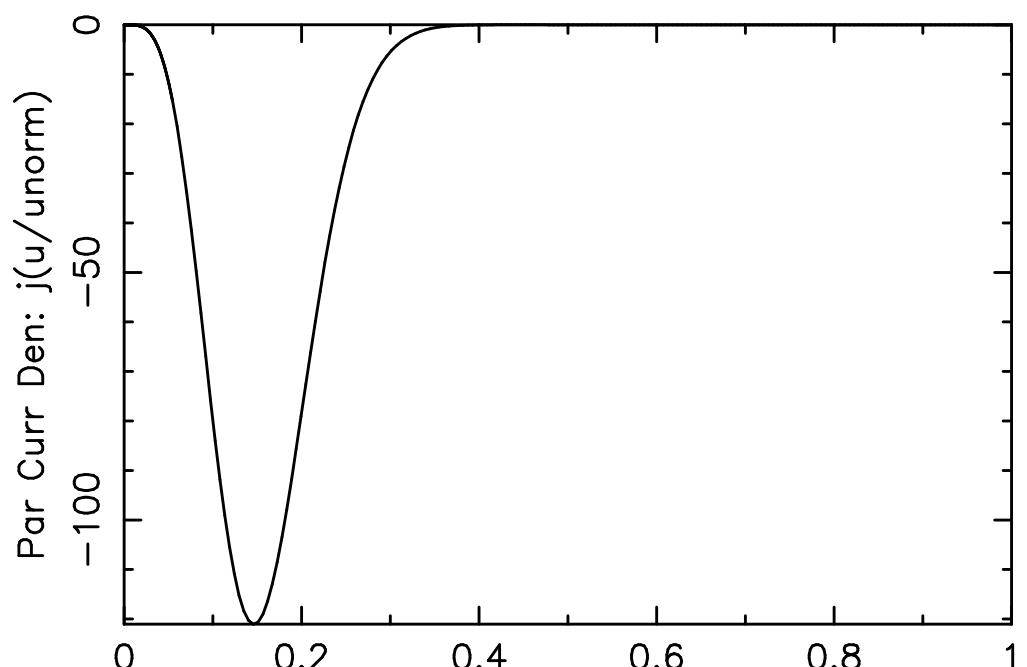


Species: 1 Power =0.3712E+00 Watts/cc

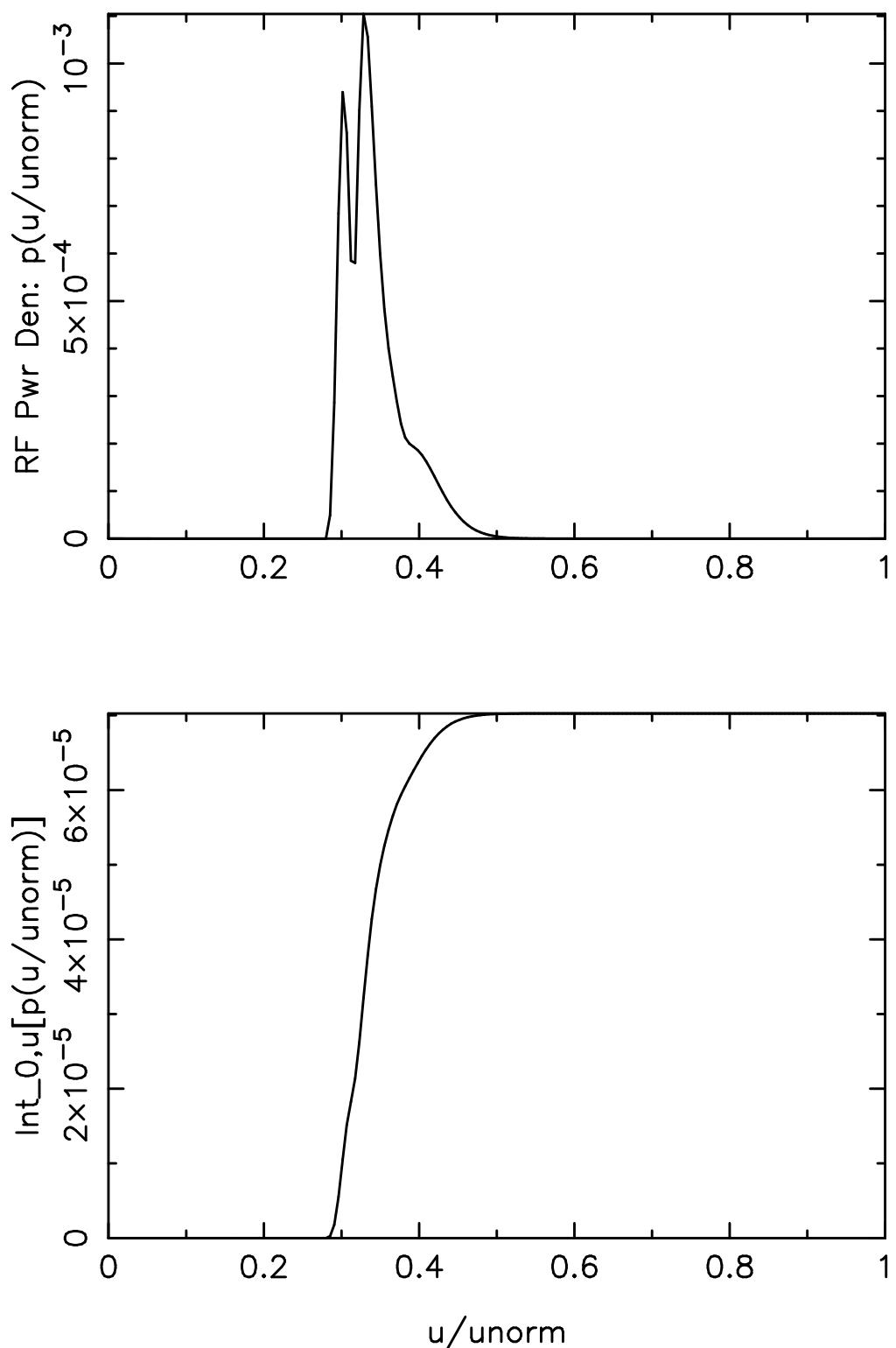


Electric field = 0.0000E+00 (V/cm)
 FSA current den of species 2 = -1.6171E+01 Amps/cm**2

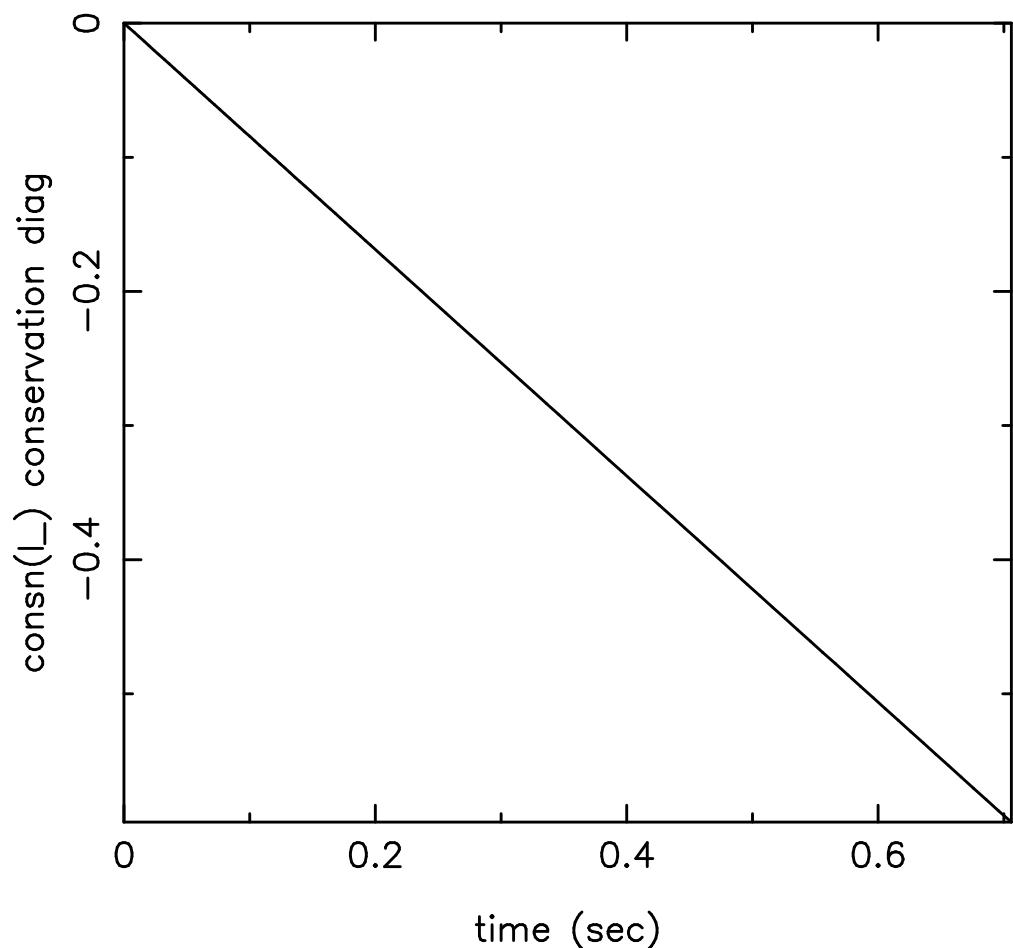
Current drive efficiency $j/(2\pi R \cdot prf)$ = -2.0636E+02 A/W
 Electron current (units $ne \cdot q \cdot v_{th}(kelec, lr_*)$) = -6.0690E-04
 power (units: $ne \cdot v_{th}(kelec, lr_*)^{**2} \cdot me \cdot nu_0$) = 2.1989E-08
 efficiency (j/p) (Fisch 1978 units) = -2.7600E+04
 efficiency (j/p) ($e/(m \cdot c \cdot nu_c$ units) = -2.3849E+02
 $v_{th}(kelec, lr_*) = \sqrt{T/m}$ = 2.7868E+09 cm/sec
 nu_0 = 7.5617E+04 Hz



Species: 2 Current =-.1617E+02 Amps/cm²



Species: 2 Power = $0.7026\text{E-}04$ Watts/cc

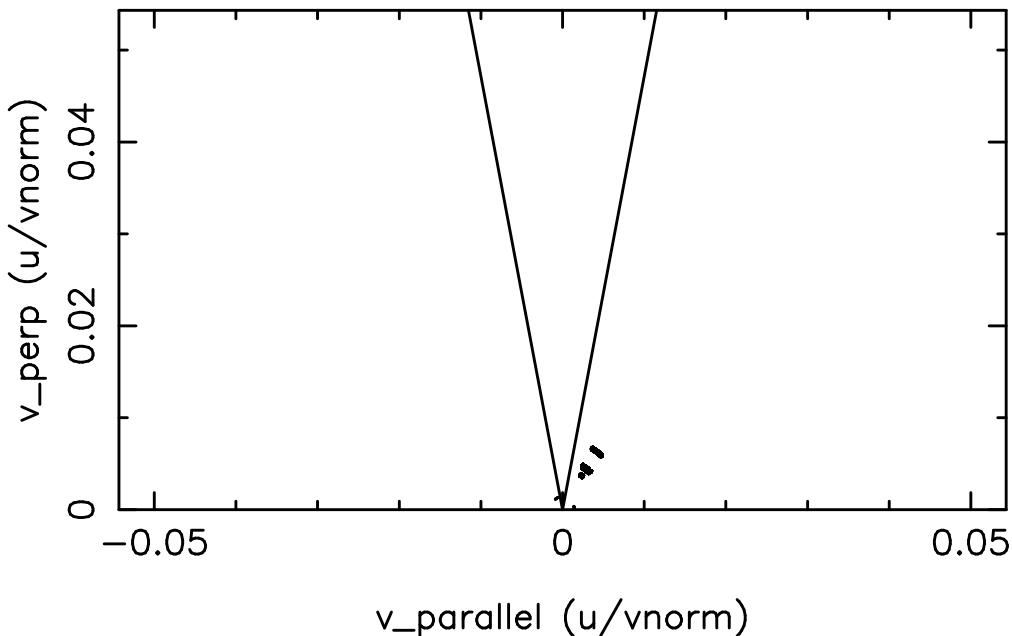


$\text{consn}(I_)$ = $-5.9565\text{E}-01$

Perfect conservation should yield machine accuracy,
or about $1.\text{e}-14$:

time step (n) is 100 time= $7.0600\text{E}-01$ secs
 r/a = $5.8571\text{E}-02$ radial position (R) = $1.8156\text{E}+02$ cm

Species 1 Source Function (units: dist. f/sec)



time step n= 100 time= 7.06E-01 secs
 $r/a = 5.857E-02$ radial position (R)= 1.8156E+02 cm
 $rya = 5.857E-02$ $R=rpcon = 1.8156E+02$ cm, Surf# 8

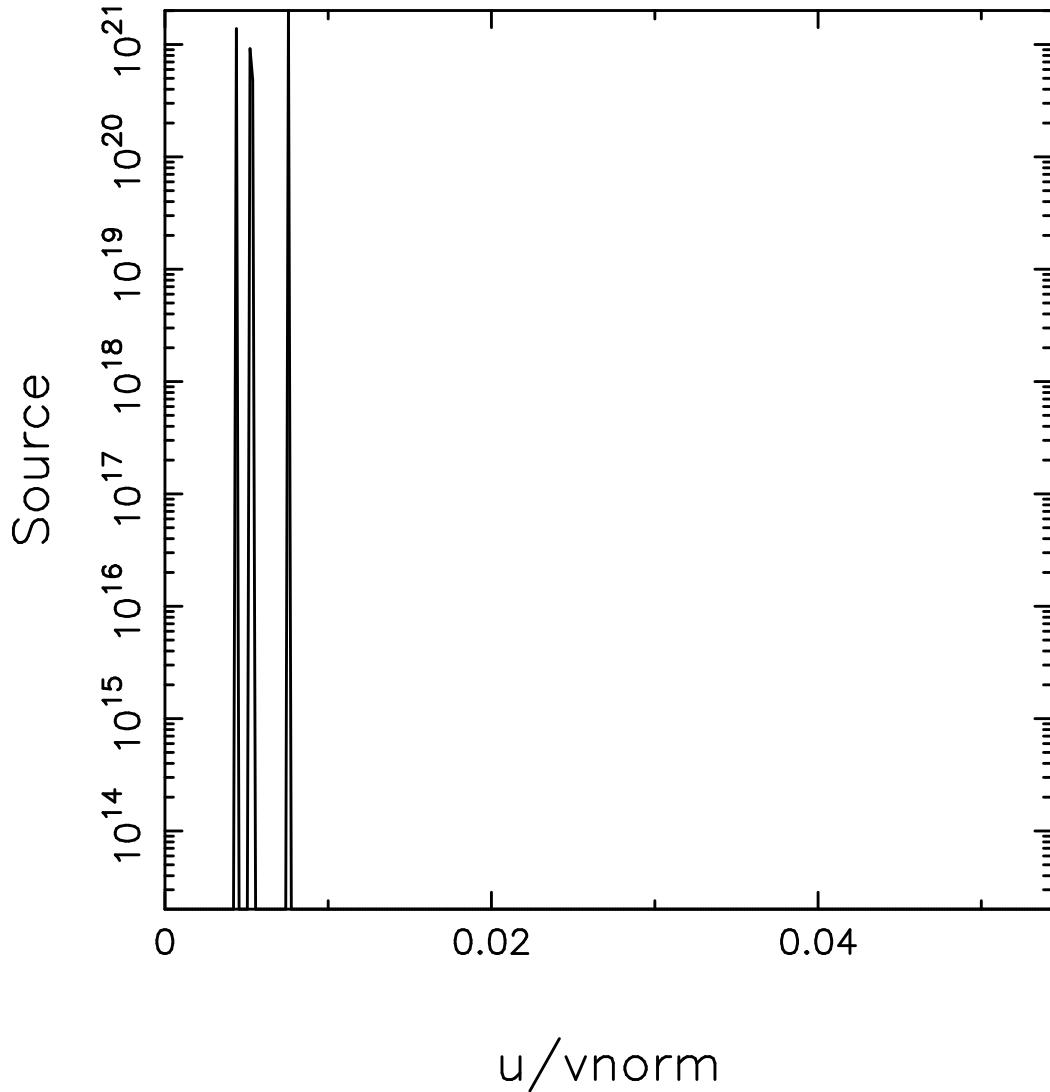
Particle source rate= 1.0075E+14 ptcls/cc/sec

Total source power [entr(..5..)]= 1.0425E+00 W/cc

Contour values:

| | | | |
|------------|------------|------------|------------|
| 4.4414E+10 | 1.7682E+11 | 7.0391E+11 | 2.8023E+12 |
| 1.1156E+13 | 4.4414E+13 | 1.7682E+14 | 7.0391E+14 |
| 2.8023E+15 | 1.1156E+16 | 4.4414E+16 | 1.7682E+17 |
| 7.0391E+17 | 2.8023E+18 | 1.1156E+19 | 4.4414E+19 |
| 1.7682E+20 | 7.0391E+20 | 2.8023E+21 | 1.1156E+22 |

Pitch Angle Avg Source vs. u

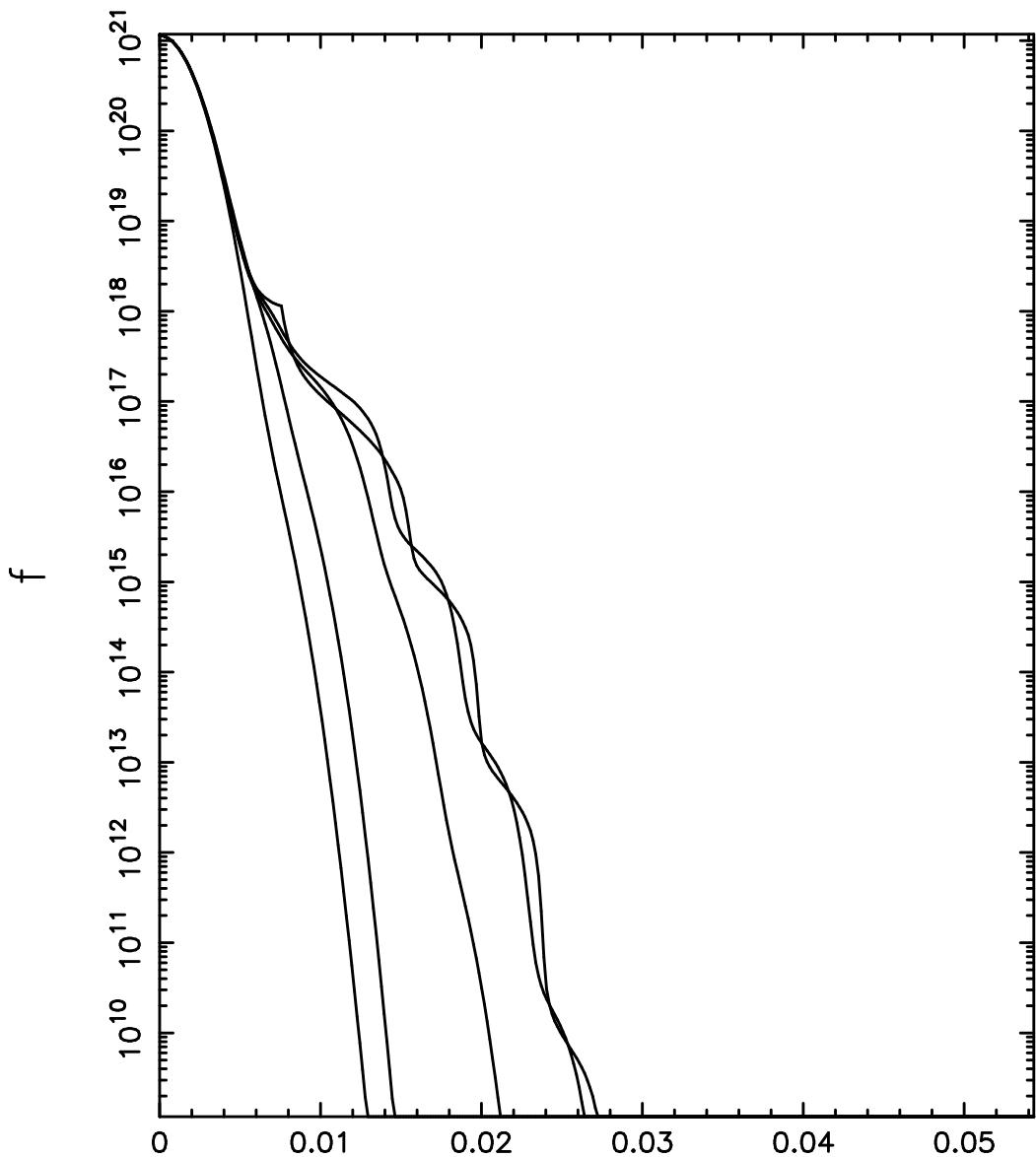


$u/vnorm$

Particle source integrated over theta0 for species 1
(normed so int(0,1)*2pi*x**2*dx=mid-plane source)
vnorm= 3.6947E+10 cm/s

time step (n) is 100 time= 7.0600E-01 secs
r/a= 5.8571E-02 radial position (R) = 1.8156E+02 cm

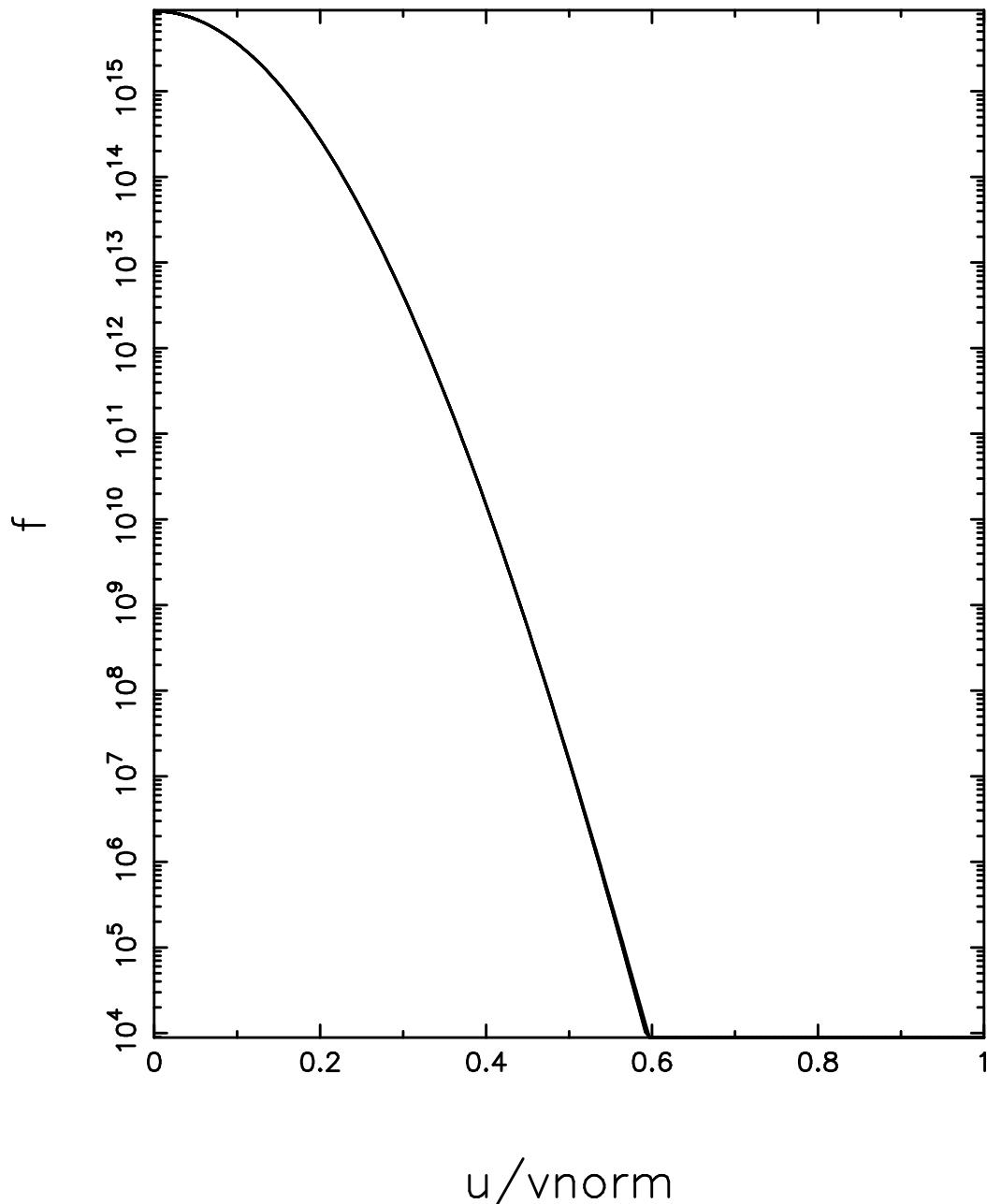
Cuts of f vs. v, at cnst pitch angle



u/v_{norm}

Distribution function vs. velocity for some angles
Species number=1, enorm= 3.00D+02
time step (n)= 100 time= 0.706000E+00 secs
r/a= 5.86E-02 radial position(R)= 1.816E+02 cm

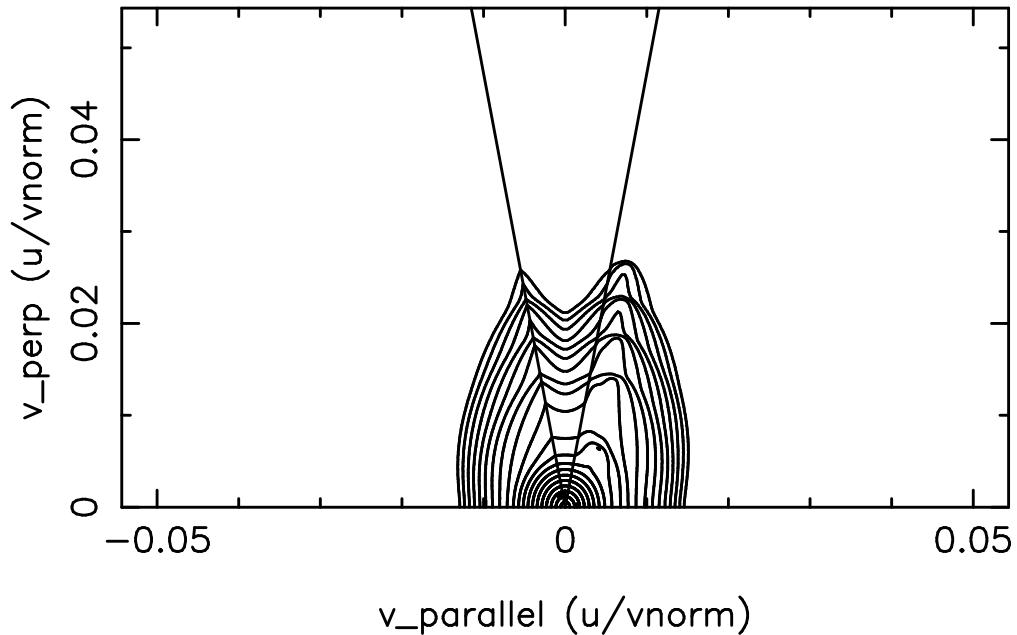
Cuts of f vs. v, at cnst pitch angle



u/v_{norm}

Distribution function vs. velocity for some angles
Species number=2, enorm= 3.00D+02
time step (n)= 100 time= 0.706000E+00 secs
r/a= 5.86E-02 radial position(R)= 1.816E+02 cm

Species 1 Distribution Function Contour Plot

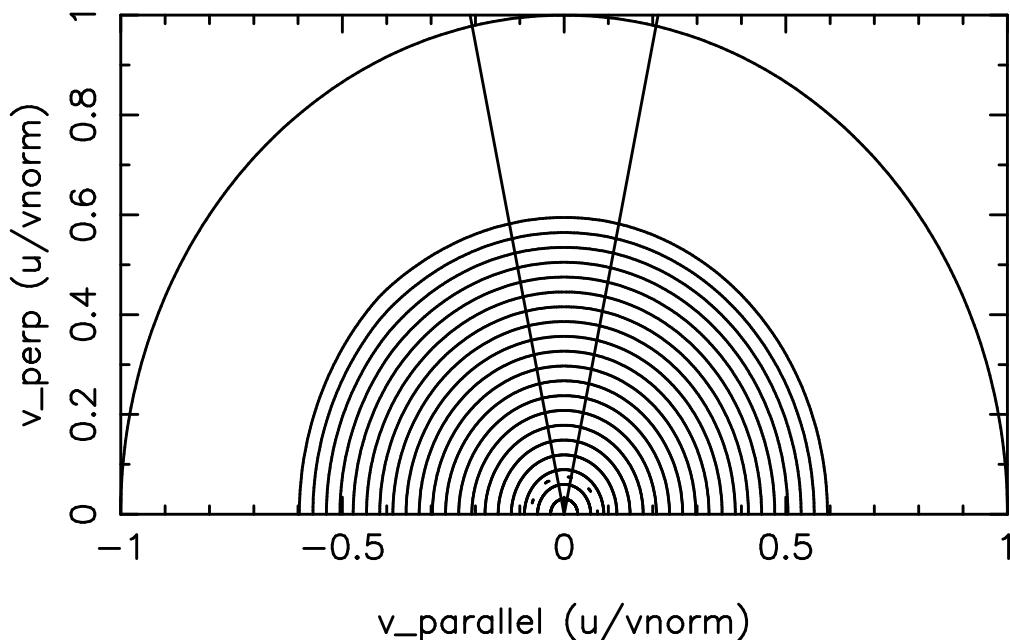


time step n= 100 time= 7.06E-01 secs
 $r/a = 5.857E-02$ radial position (R)= 1.8156E+02 cm
 $rya = 5.857E-02$ R=rpcon= 1.8156E+02 cm, Surf# 8

Contour values:

| | | | |
|--------------|--------------|--------------|--------------|
| 1.058178E+21 | 8.326700E+20 | 5.592809E+20 | 3.213380E+20 |
| 1.583942E+20 | 6.722605E+19 | 2.467175E+19 | 7.866749E+18 |
| 2.190653E+18 | 5.357017E+17 | 1.156983E+17 | 2.219859E+16 |
| 3.806094E+15 | 5.865977E+14 | 8.173785E+13 | 1.035585E+13 |
| 1.199528E+12 | 1.277006E+11 | 1.255829E+10 | 1.146352E+09 |

Species 2 Distribution Function Contour Plot



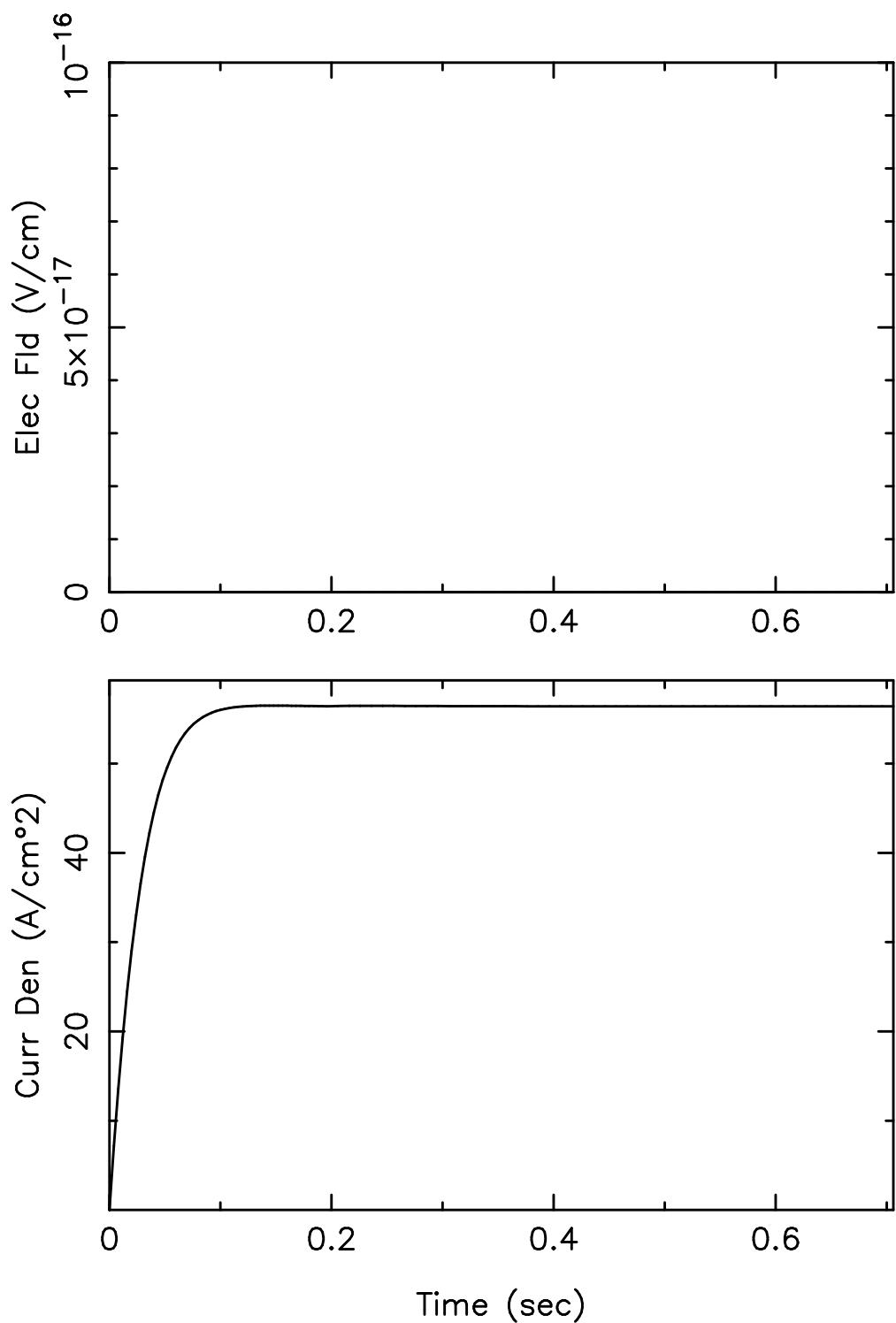
time step n= 100 time= 7.06E-01 secs
 $r/a = 5.857E-02$ radial position (R)= 1.8156E+02 cm
 $rya = 5.857E-02$ R=rpcon= 1.8156E+02 cm, Surf# 8

Contour values:

| | | | |
|--------------|--------------|--------------|--------------|
| 7.969255E+15 | 6.321810E+15 | 4.301885E+15 | 2.514940E+15 |
| 1.265757E+15 | 5.498678E+14 | 2.068185E+14 | 6.758744E+13 |
| 1.926503E+13 | 4.809664E+12 | 1.056385E+12 | 2.050662E+11 |
| 3.534995E+10 | 5.437495E+09 | 7.499457E+08 | 9.319270E+07 |
| 1.048417E+07 | 1.072828E+06 | 1.003153E+05 | 8.609698E+03 |

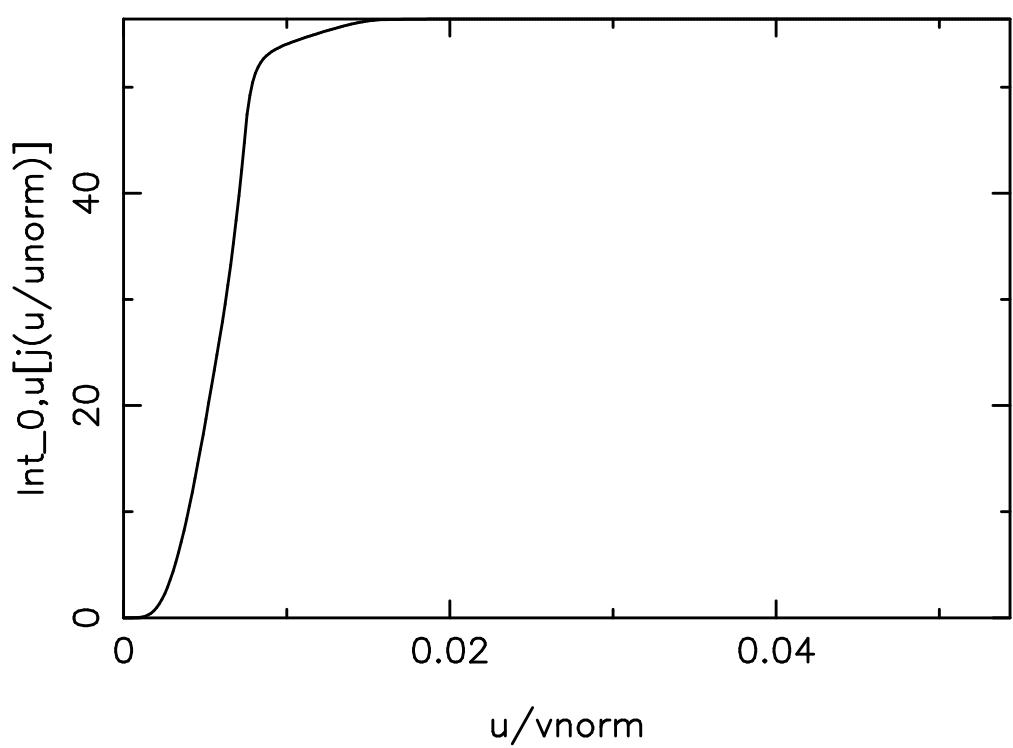
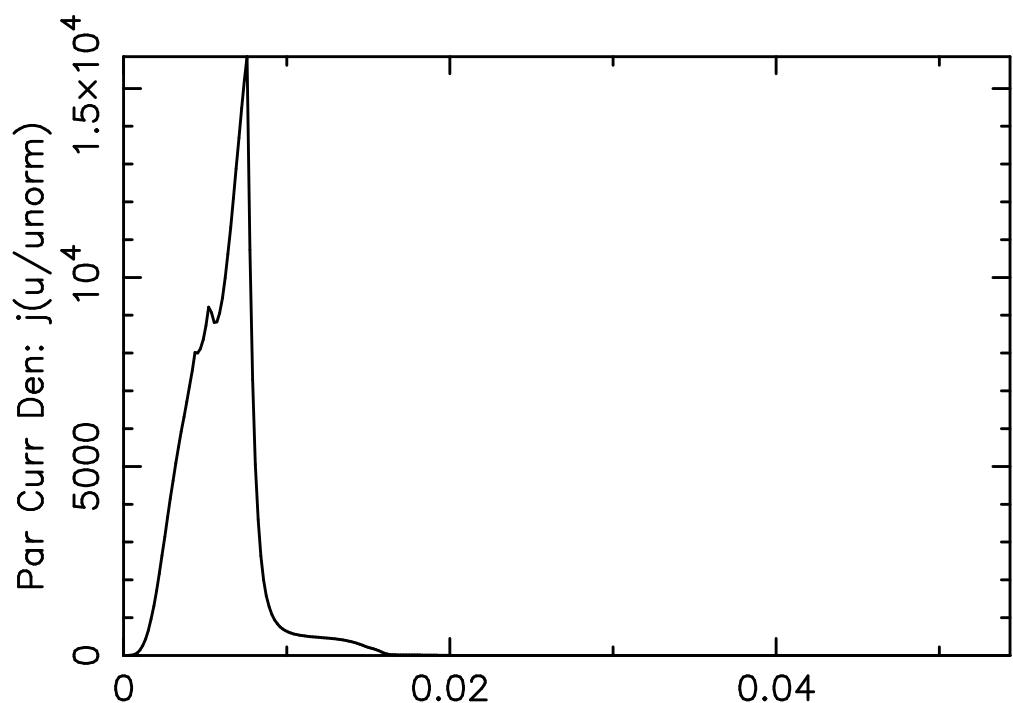
LOCAL RADIAL QUANTITIES

```
time step n= 100,      time= 7.0600E-01 secs
flux surf= 9      total flux surfs= 65
r/a= 6.551E-02      radial position (R)= 1.8200E+02 cms
rya= 6.551E-02      R=rpcon= 1.820E+02 cm
enormi, enorme(=enorm) (kev) = 3250.000      300.000
vnorm/c = 1.2324136
vthe (sqrt(te/me))/c = 0.0928870
vthe/vnorm = 0.0753700
k= 1 vth(k)/vnorm = 0.0014365
k= 2 vth(k)/vnorm = 0.0753700
k= 3 vth(k)/vnorm = 0.0014365
k= 4 vth(k)/vnorm = 0.0001435
k= 5 vth(k)/vnorm = 0.0753700
```

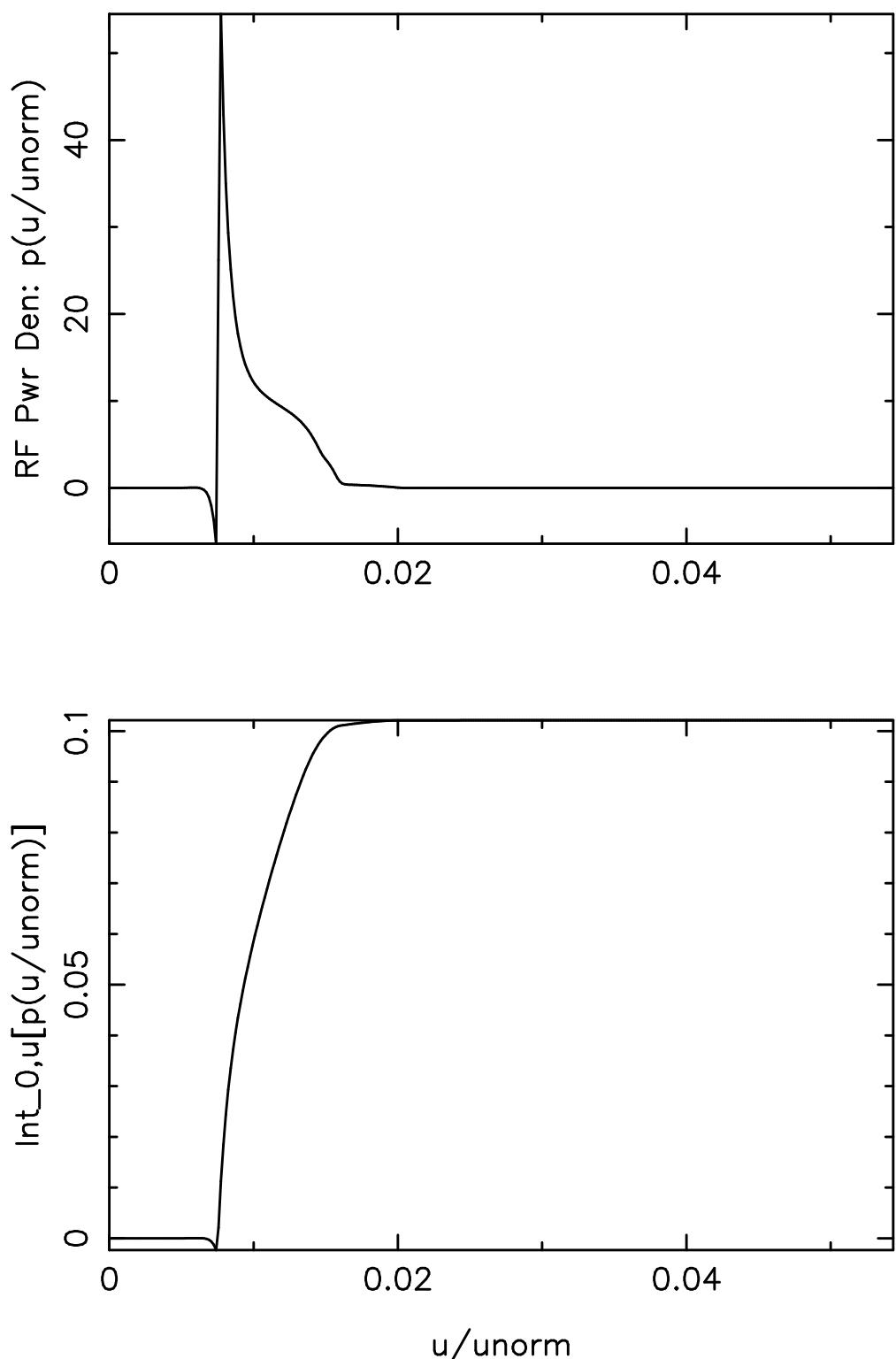


Electric field = 0.0000E+00 (V/cm)
FSA current den of species 1 = 5.6420E+01 Amps/cm**2

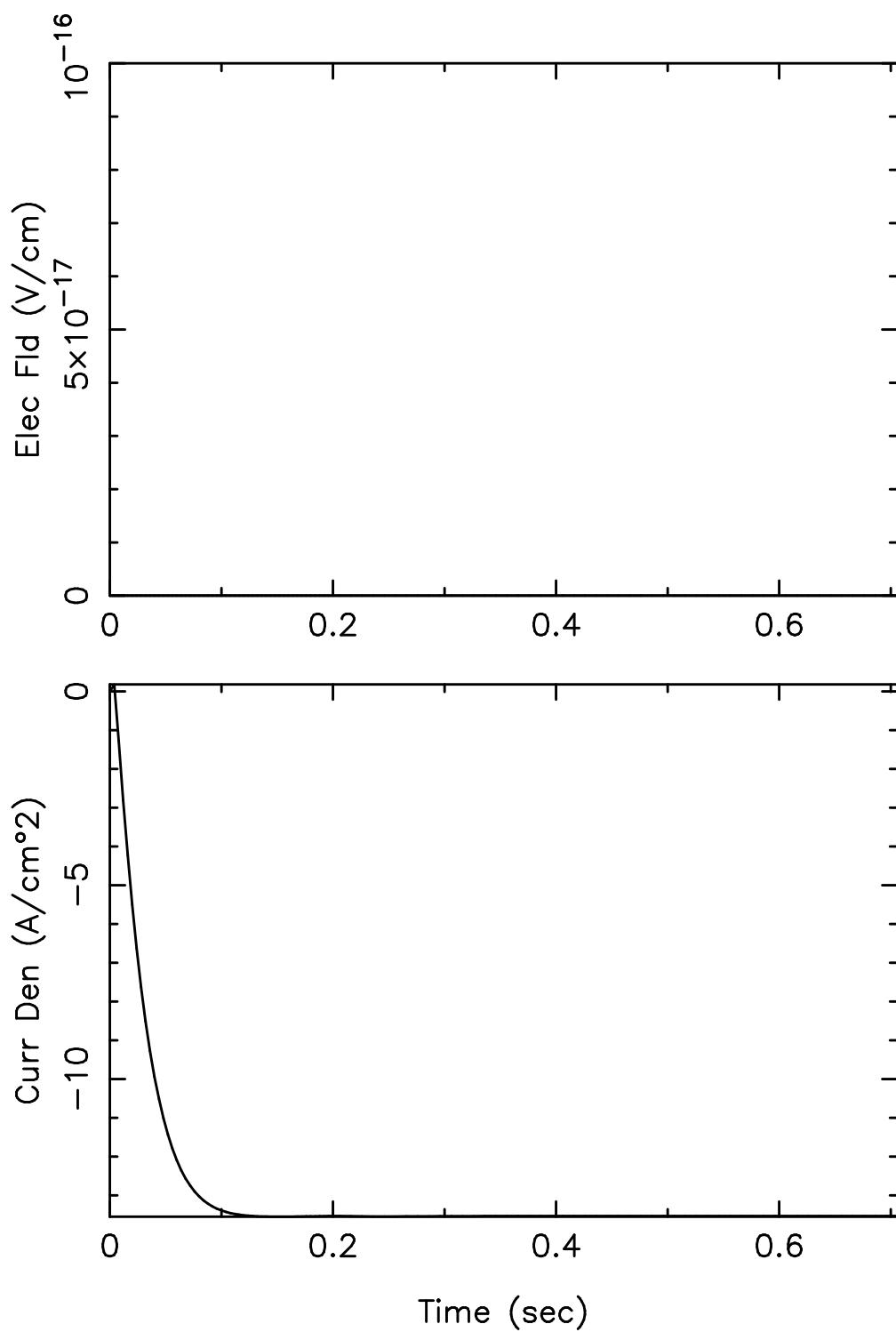
Current drive efficiency $j/(2\pi R \rho f)$ = 4.9544E-01 A/W



Species: 1 Current = $0.5642E+02$ Amps/cm 2

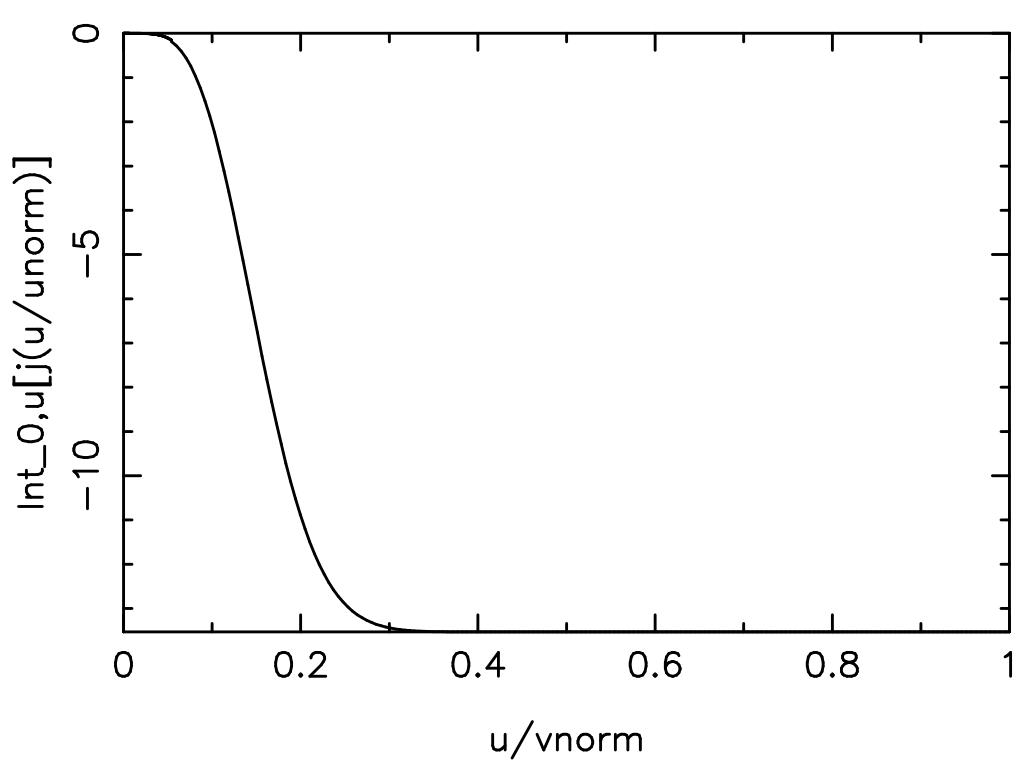
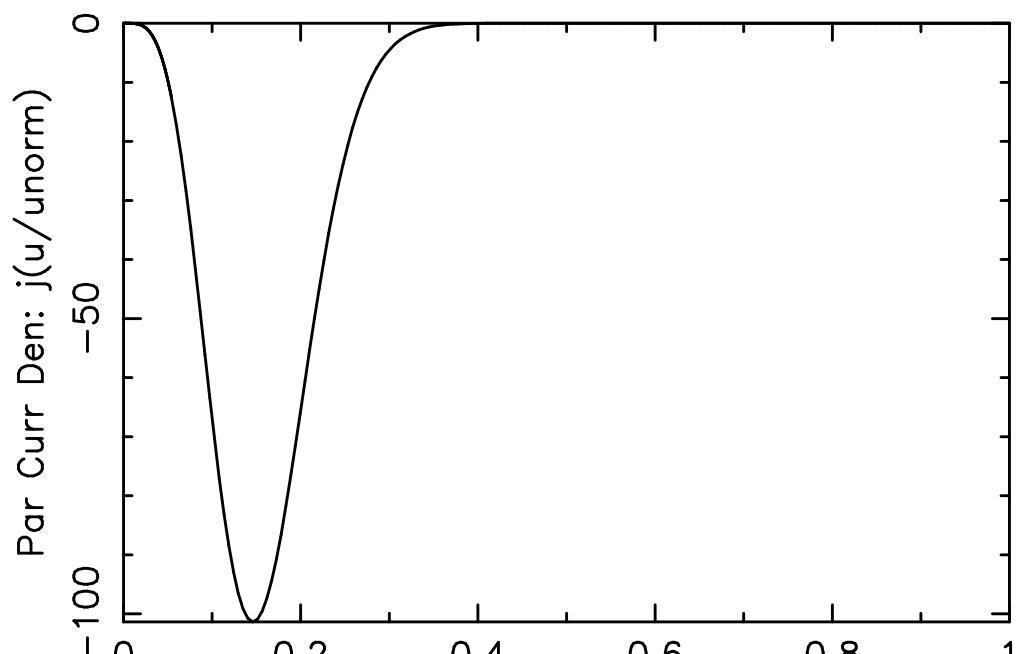


Species: 1 Power =0.1021E+00 Watts/cc

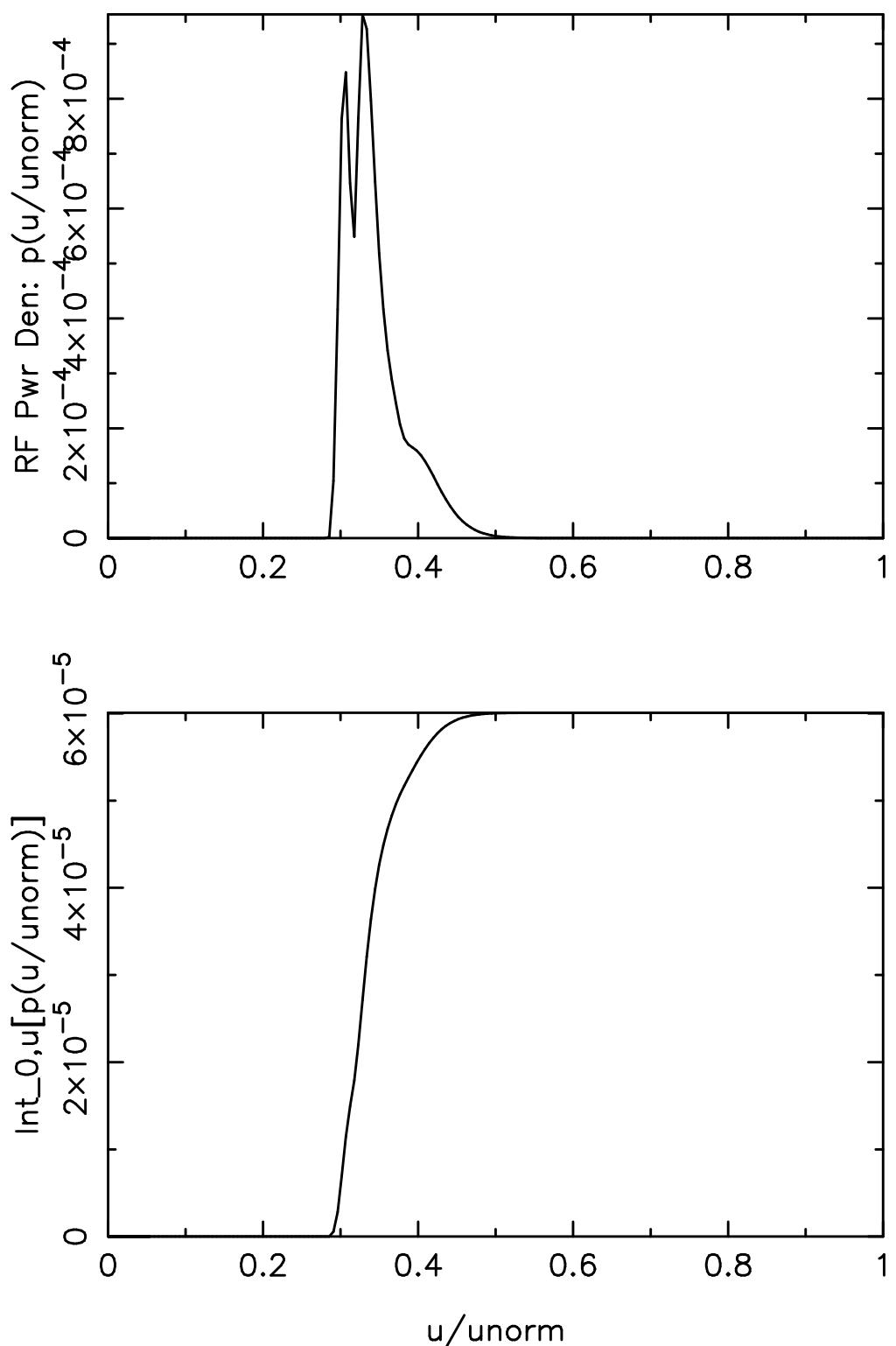


Electric field = 0.0000E+00 (V/cm)
 FSA current den of species 2 = -1.3529E+01 Amps/cm**2

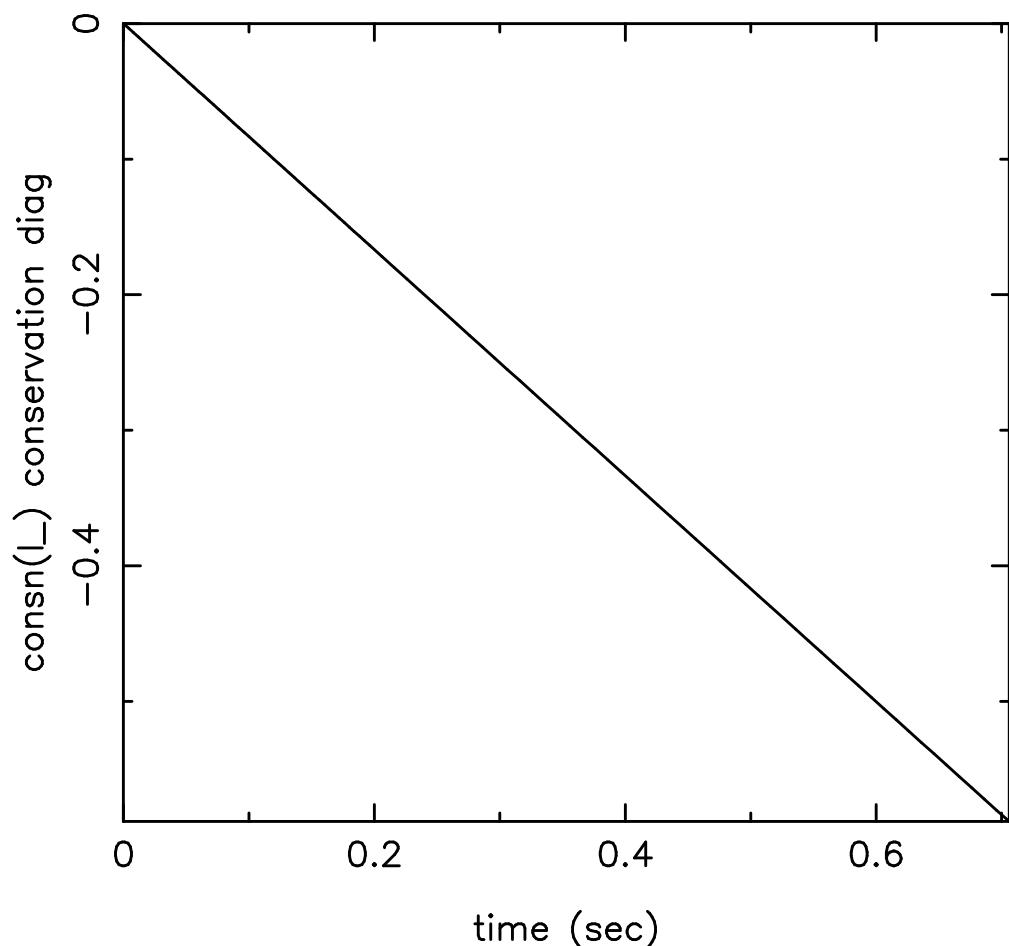
Current drive efficiency $j/(2\pi R \cdot prf)$ = -2.0196E+02 A/W
 Electron current (units $ne \cdot q \cdot v_{th}(kelec, lr_2)$) = -5.0871E-04
 power (units: $ne \cdot v_{th}(kelec, lr_2)^2 \cdot me \cdot nu_0$) = 1.8832E-08
 efficiency (j/p) (Fisch 1978 units) = -2.7014E+04
 efficiency (j/p) ($e/(m \cdot c \cdot nu_c)$ units) = -2.3308E+02
 $v_{th}(kelec, lr_2) = \sqrt{T/m}$ = 2.7847E+09 cm/sec
 nu_0 = 7.5701E+04 Hz



Species: 2 Current =-.1353E+02 Amps/cm²



Species: 2 Power = $0.6007\text{E}-04$ Watts/cc

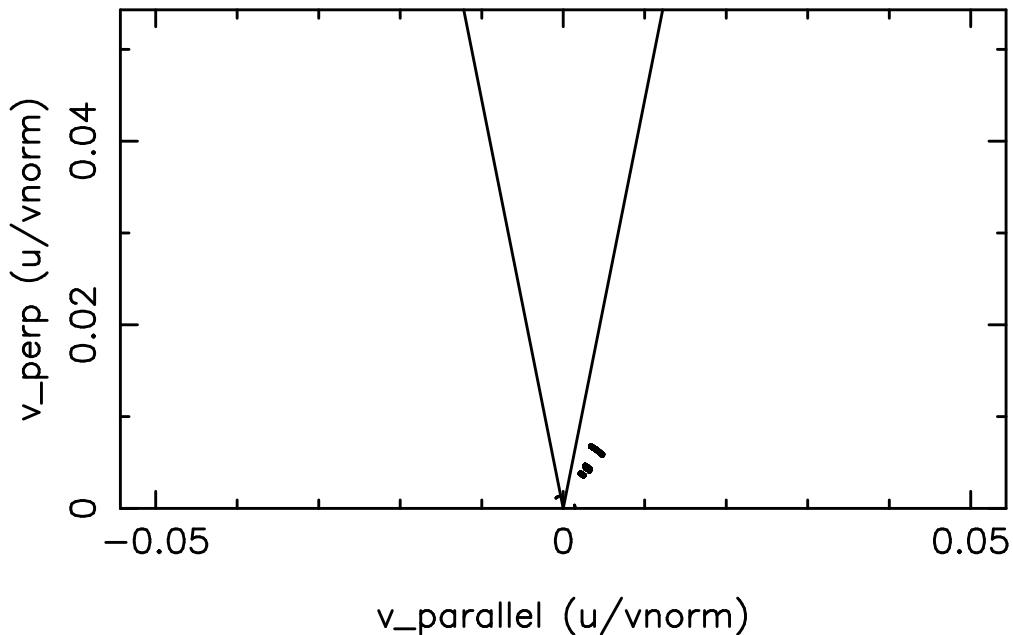


$\text{consn}(I_)$ = $-5.8863\text{E}-01$

Perfect conservation should yield machine accuracy,
or about $1.\text{e}-14$:

time step (n) is 100 time= $7.0600\text{E}-01$ secs
 r/a = $6.5510\text{E}-02$ radial position (R) = $1.8200\text{E}+02$ cm

Species 1 Source Function (units: dist. f/sec)



time step n= 100 time= 7.06E-01 secs
 $r/a = 6.551E-02$ radial position (R)= 1.8200E+02 cm
 $rya = 6.551E-02$ $R=rpcon= 1.8200E+02$ cm, Surf# 9

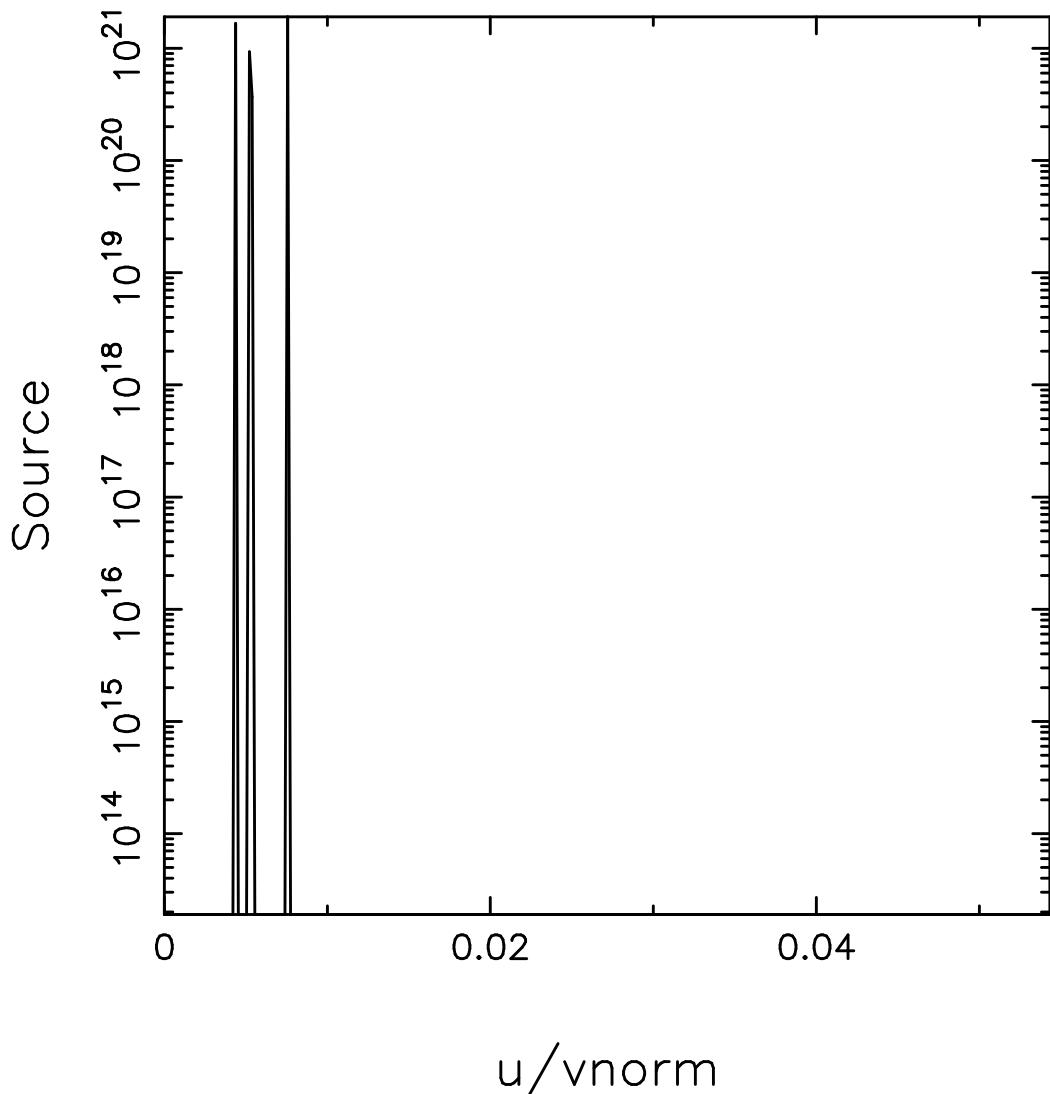
Particle source rate= 9.9452E+13 ptcls/cc/sec

Total source power [entr(..5..)]= 1.0075E+00 W/cc

Contour values:

| | | | |
|------------|------------|------------|------------|
| 2.6165E+10 | 1.0416E+11 | 4.1469E+11 | 1.6509E+12 |
| 6.5723E+12 | 2.6165E+13 | 1.0416E+14 | 4.1469E+14 |
| 1.6509E+15 | 6.5723E+15 | 2.6165E+16 | 1.0416E+17 |
| 4.1469E+17 | 1.6509E+18 | 6.5723E+18 | 2.6165E+19 |
| 1.0416E+20 | 4.1469E+20 | 1.6509E+21 | 6.5723E+21 |

Pitch Angle Avg Source vs. u

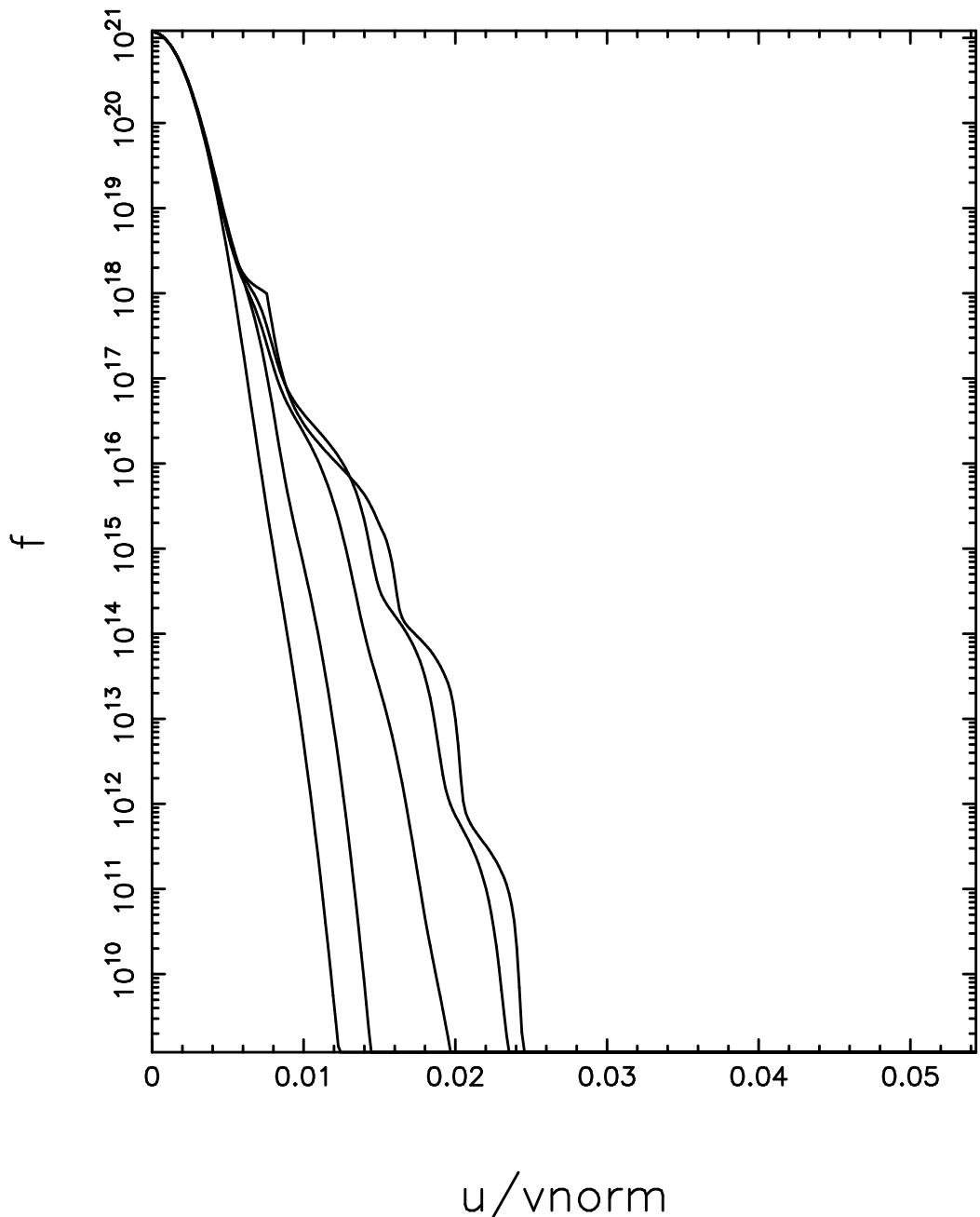


u/v_{norm}

Particle source integrated over theta0 for species 1
(normed so int(0,1)*2pi*x**2*dx=mid-plane source)
vnorm= 3.6947E+10 cm/s

time step (n) is 100 time= 7.0600E-01 secs
r/a= 6.5510E-02 radial position (R) = 1.8200E+02 cm

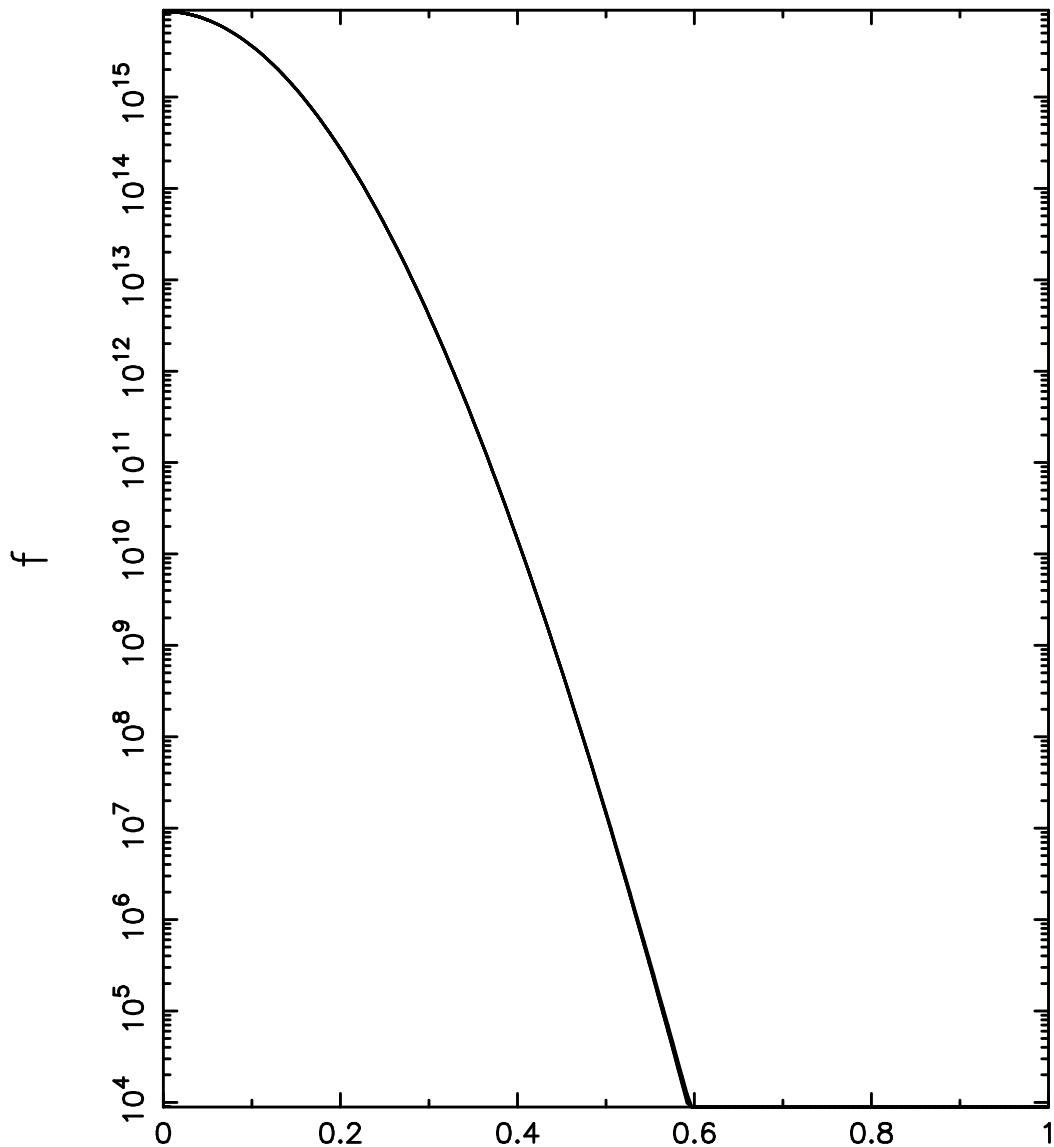
Cuts of f vs. v, at cnst pitch angle



u/v_{norm}

Distribution function vs. velocity for some angles
Species number=1, enorm= 3.00D+02
time step (n)= 100 time= 0.706000E+00 secs
r/a= 6.55E-02 radial position(R)= 1.820E+02 cm

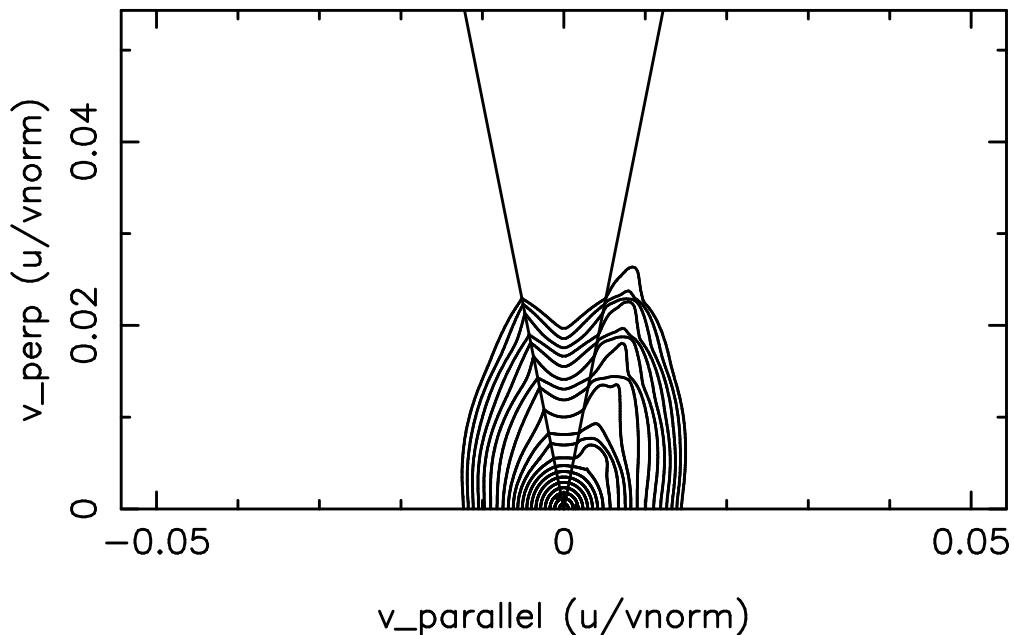
Cuts of f vs. v, at cnst pitch angle



u/v_{norm}

Distribution function vs. velocity for some angles
Species number=2, enorm= 3.00D+02
time step (n)= 100 time= 0.706000E+00 secs
r/a= 6.55E-02 radial position(R)= 1.820E+02 cm

Species 1 Distribution Function Contour Plot

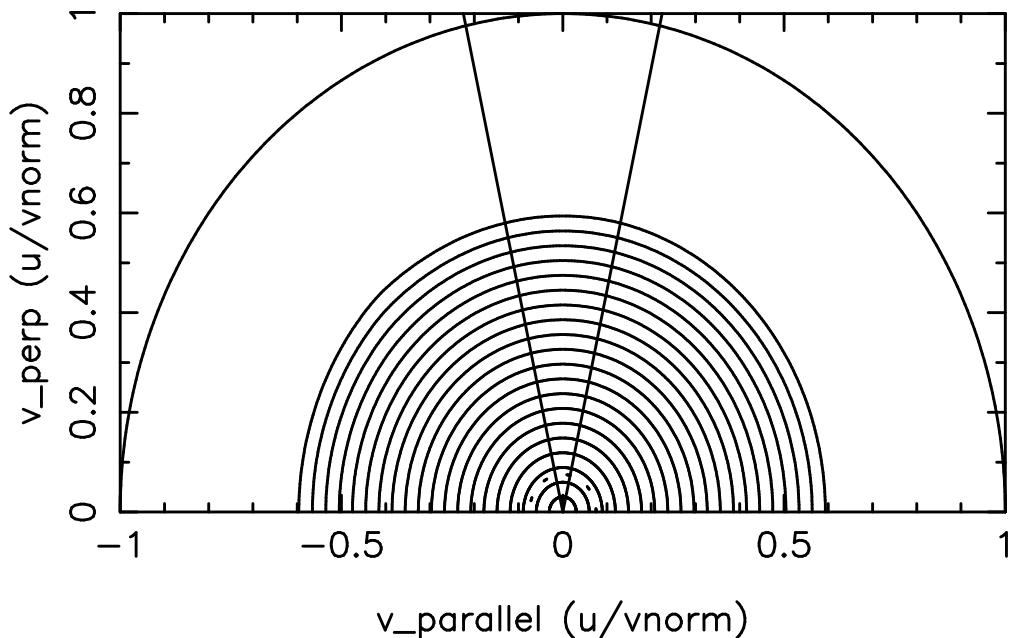


time step n= 100 time= 7.06E-01 secs
 $r/a = 6.551E-02$ radial position (R)= 1.8200E+02 cm
 $rya = 6.551E-02$ $R=rpcon= 1.8200E+02$ cm, Surf# 9

Contour values:

| | | | |
|--------------|--------------|--------------|--------------|
| 1.085659E+21 | 8.543362E+20 | 5.738783E+20 | 3.297592E+20 |
| 1.625654E+20 | 6.900588E+19 | 2.532861E+19 | 8.077352E+18 |
| 2.249604E+18 | 5.501826E+17 | 1.188371E+17 | 2.280227E+16 |
| 3.909701E+15 | 6.025558E+14 | 8.395609E+13 | 1.063566E+13 |
| 1.231728E+12 | 1.310985E+11 | 1.288873E+10 | 1.176104E+09 |

Species 2 Distribution Function Contour Plot



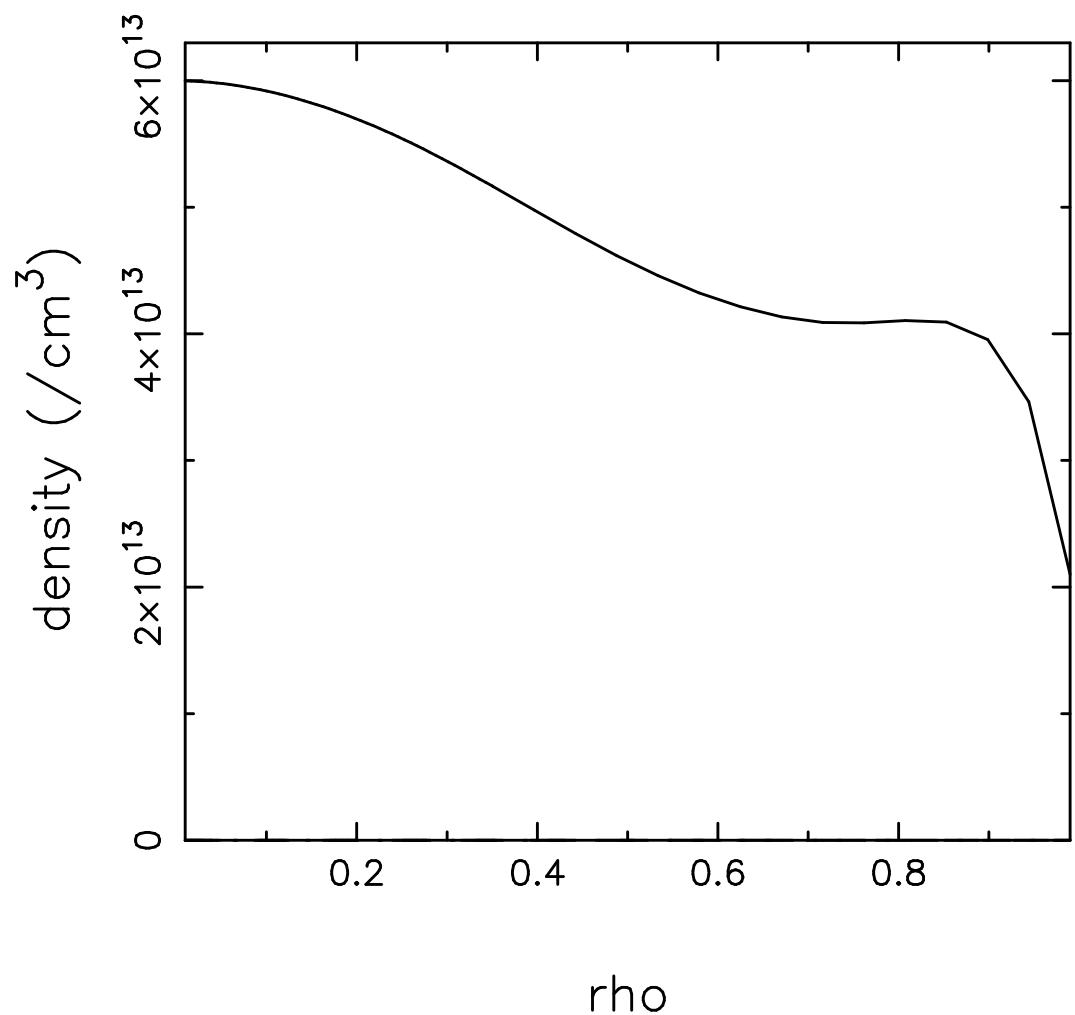
time step n= 100 time= 7.06E-01 secs
 $r/a = 6.551E-02$ radial position (R)= 1.8200E+02 cm
 $rya = 6.551E-02$ $R=rpcon= 1.8200E+02$ cm, Surf# 9

Contour values:

| | | | |
|--------------|--------------|--------------|--------------|
| 7.990082E+15 | 6.338563E+15 | 4.313539E+15 | 2.521951E+15 |
| 1.269407E+15 | 5.515118E+14 | 2.074603E+14 | 6.780490E+13 |
| 1.932912E+13 | 4.826138E+12 | 1.060089E+12 | 2.057971E+11 |
| 3.547697E+10 | 5.457007E+09 | 7.526037E+08 | 9.351483E+07 |
| 1.051899E+07 | 1.076192E+06 | 1.006059E+05 | 8.632092E+03 |

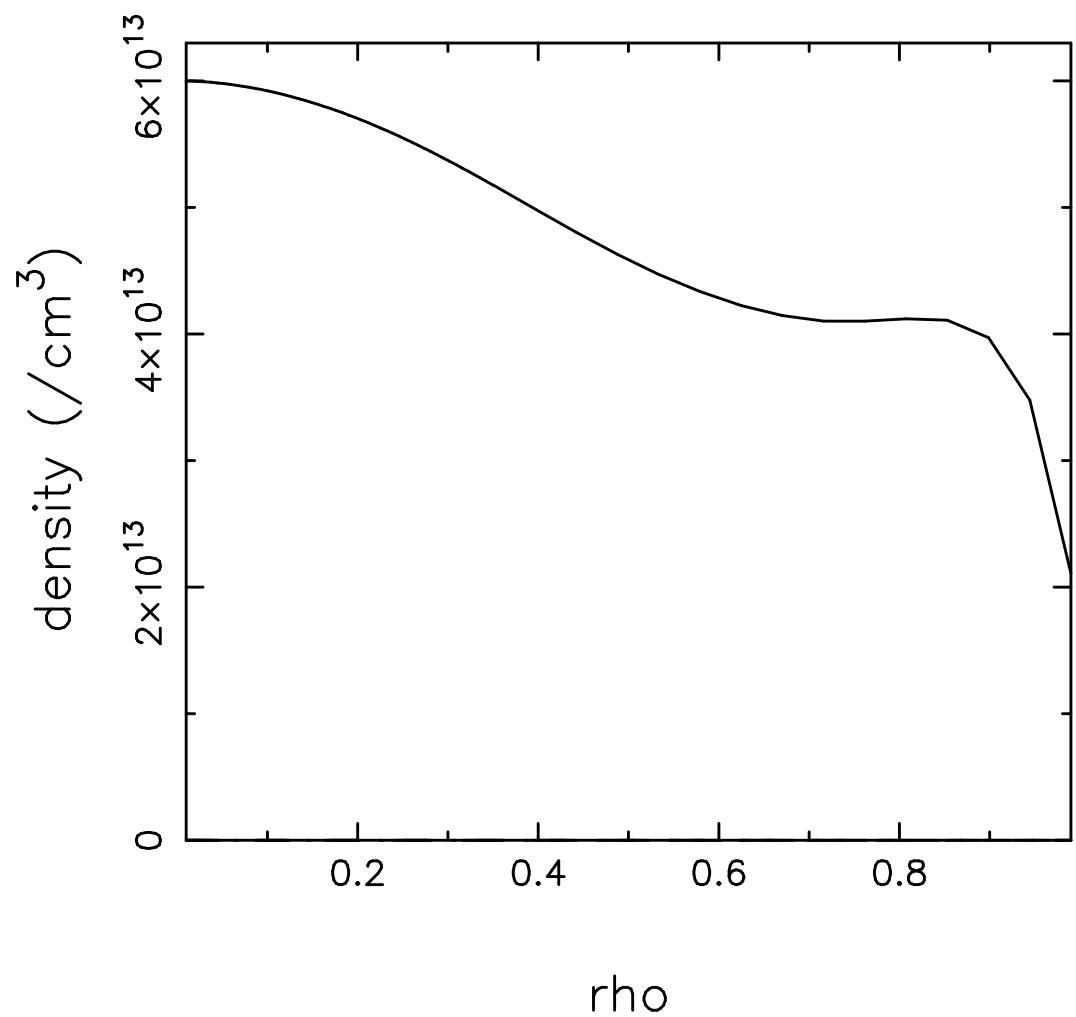
DENSITIES (/CC) OF SPECIES

species no. 1 D general time step n= 100



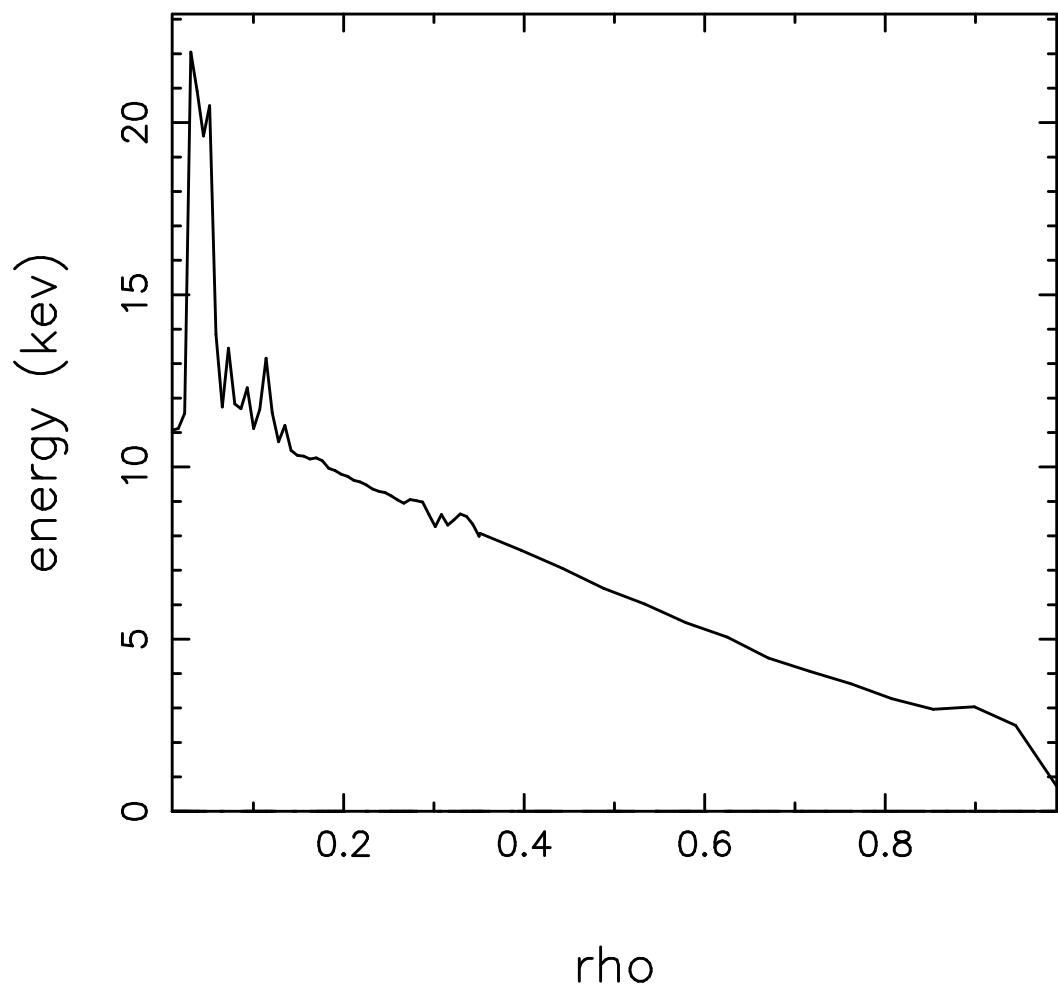
DENSITIES (/CC) OF SPECIES

species no. 2 e general time step n= 100



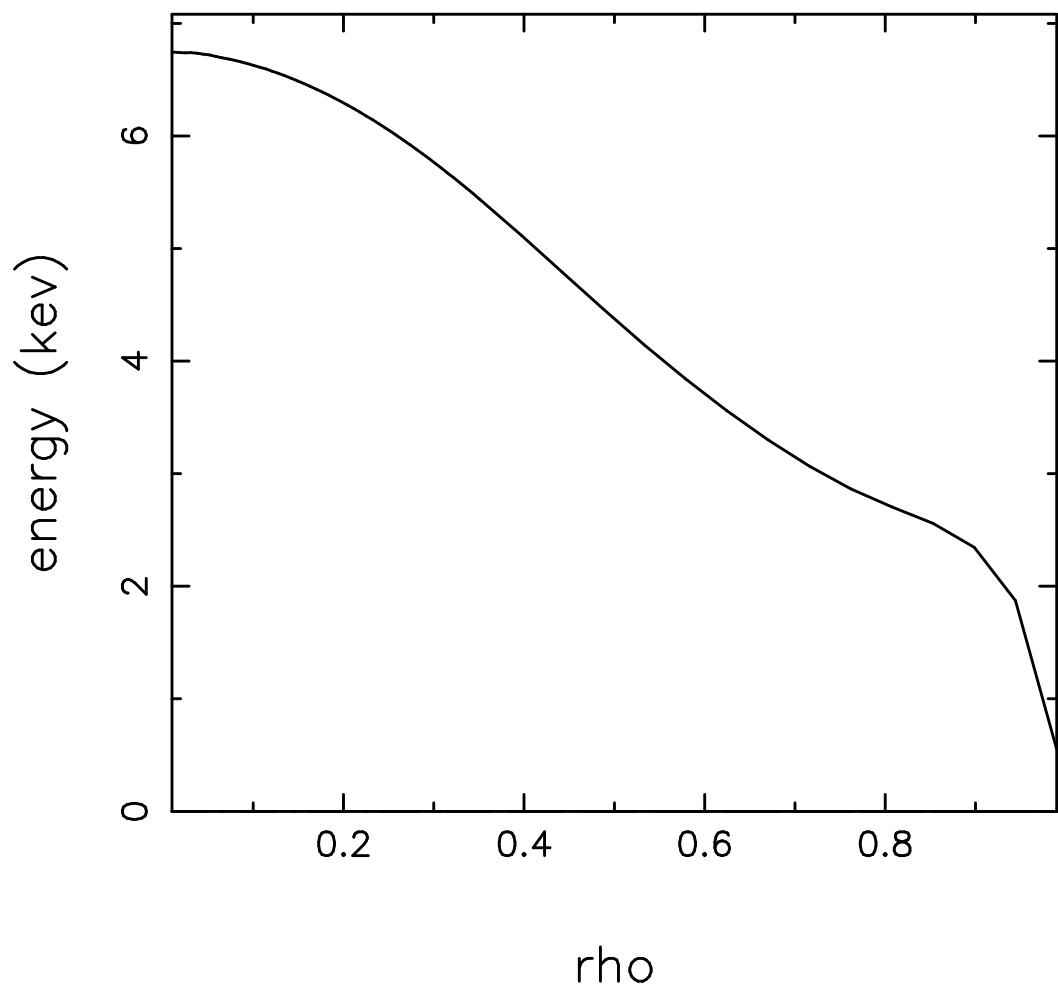
ENERGIES OF SPECIES IN KEV
(Solid: <..>_FSA)

species no. 1 D general time step n= 100



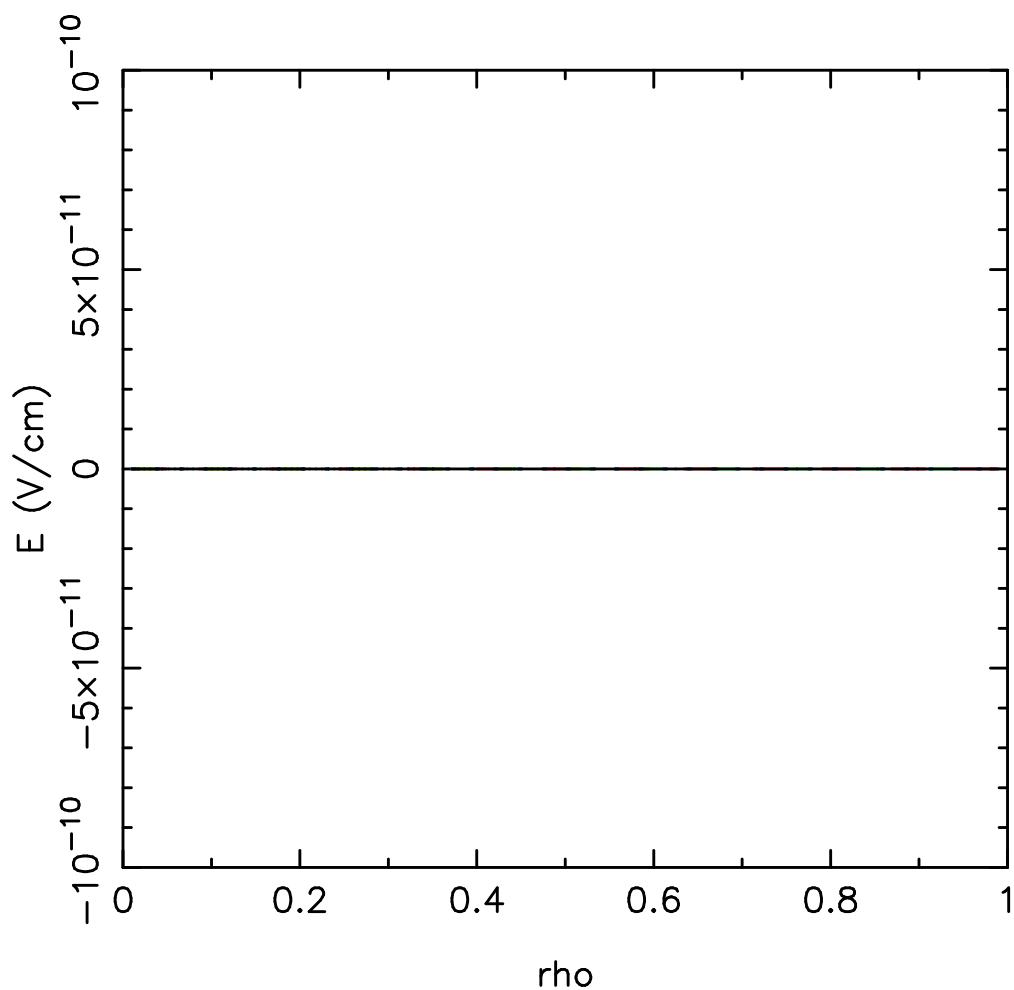
ENERGIES OF SPECIES IN KEV
(Solid: <..>_FSA)

species no. 2 e general time step n= 100



Electric field (V/cm)

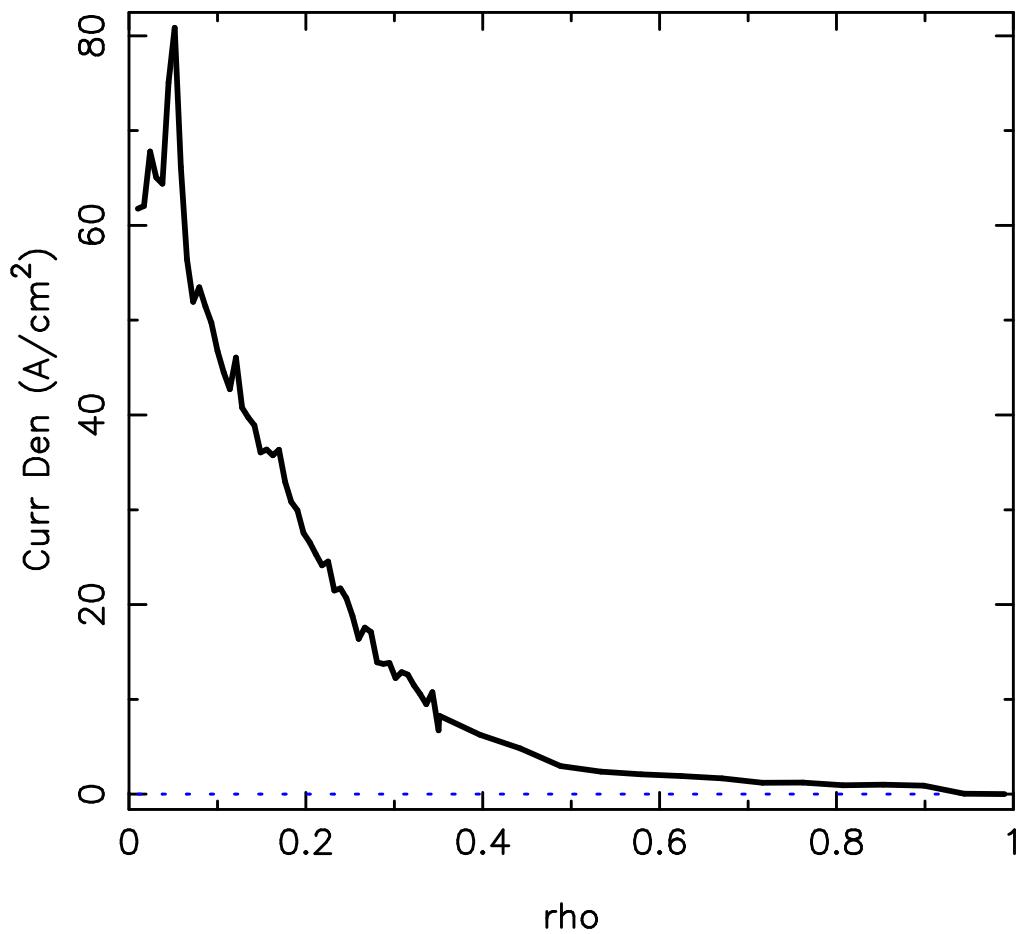
n= 1; t= 0.000000E+00sec
n= 33; t= 1.280000E-01sec
n= 67; t= 3.660000E-01sec
n= 100; t= 6.960000E-01sec



FLUX SURF. AV. CURNT. (AMPS/CM²)

Species: 1 Current from sum[curr*darea]= 9.048427E+04 A

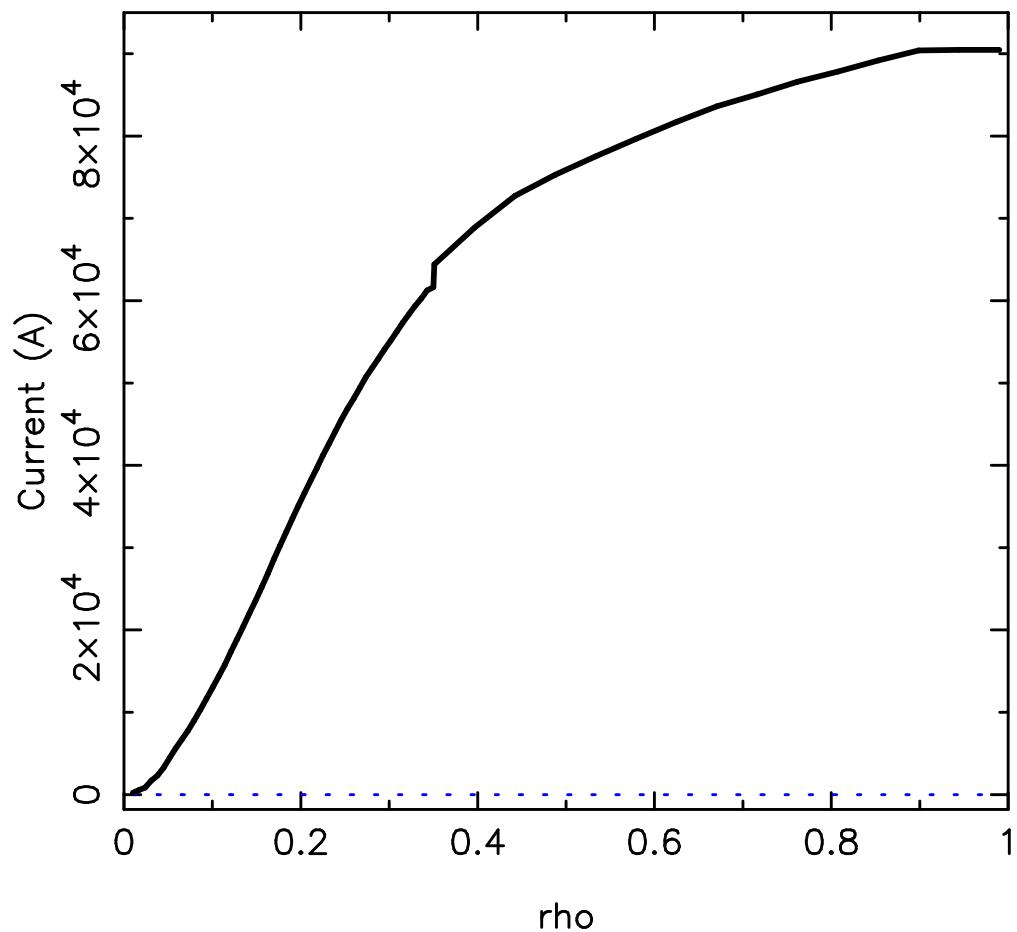
Blue/dotted: Bootstrap (fit model: bscurm() array) 0.000E+00A
Solid/thin: Integral over f (curr() array) 9.048E+04A
Solid/bold: All the above together **9.048E+04A**



Current (A) INTEGRATED UP TO RHO or PSI

Species: 1 Current from sum[curr*darea]= 9.048427E+04 A

Blue/dotted: Bootstrap (fit model: bscurm() array) 0.000E+00A
Solid/thin: From Integral over f (curr()) 9.048E+04A
Solid/bold: From All the above together **9.048E+04A**



FLUX SURF. AV. CURNT. (AMPS/CM²)

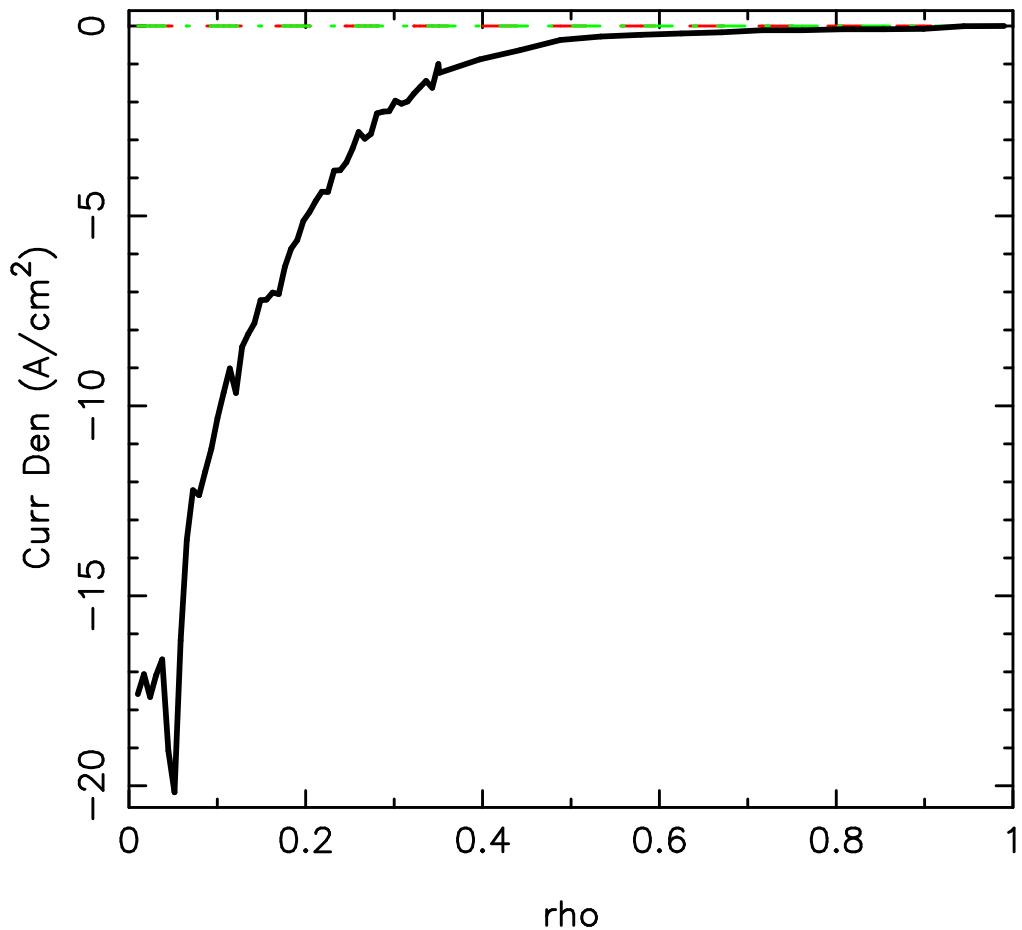
Species: 2 Current from sum[curr*darea]= -1.538901E+04 A

Red--- ($\sigma_{coll_neo} - \sigma_{banana}$)*Ephi 0.000E+00A

Green-.— Bootstrap (fit model: bscurm()) 0.000E+00A

Solid/thin: Integral over f (curr() array) -1.539E+04A

Solid/bold: All the above together **-1.539E+04A**



Current (A) INTEGRATED UP TO RHO or PSI

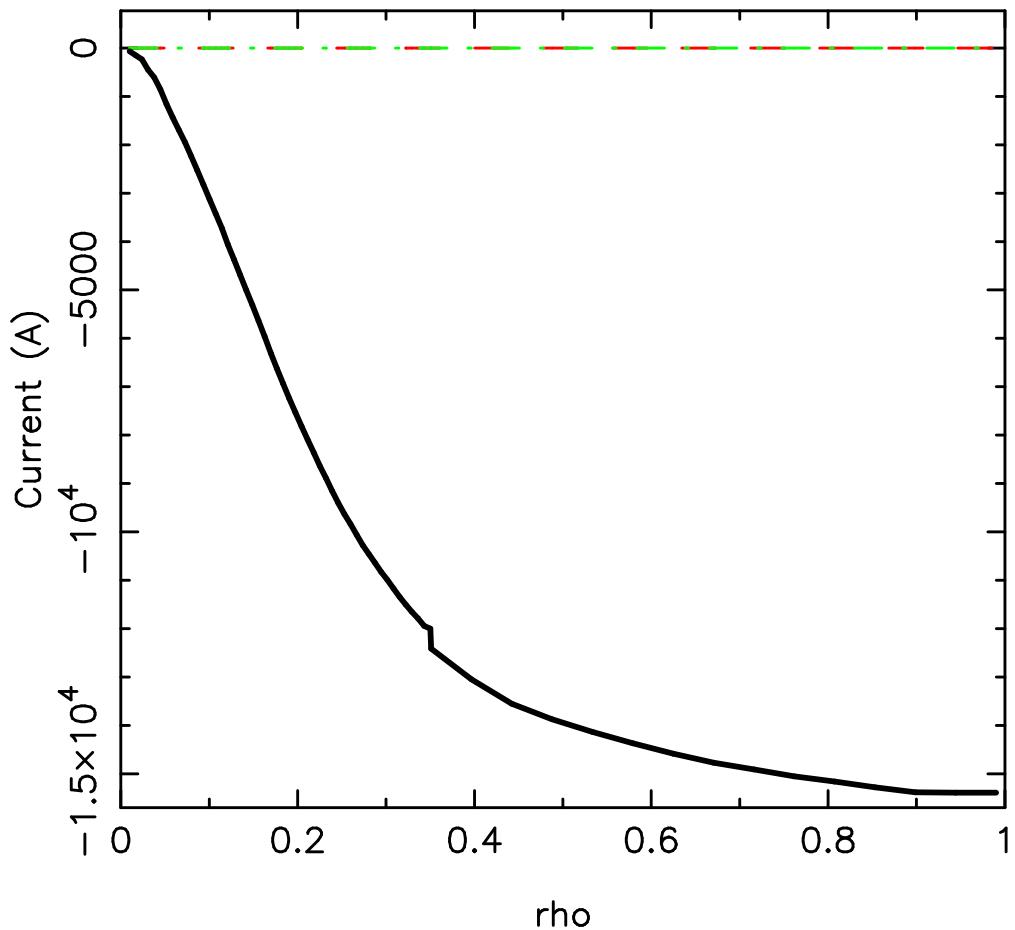
Species: 2 Current from sum[curr*darea]= -1.538901E+04 A

Red-- (sigma_coll_neo-sigma_banana)*Ephi 0.000E+00A

Green-.— Bootstrap (fit model: bscurm()) 0.000E+00A

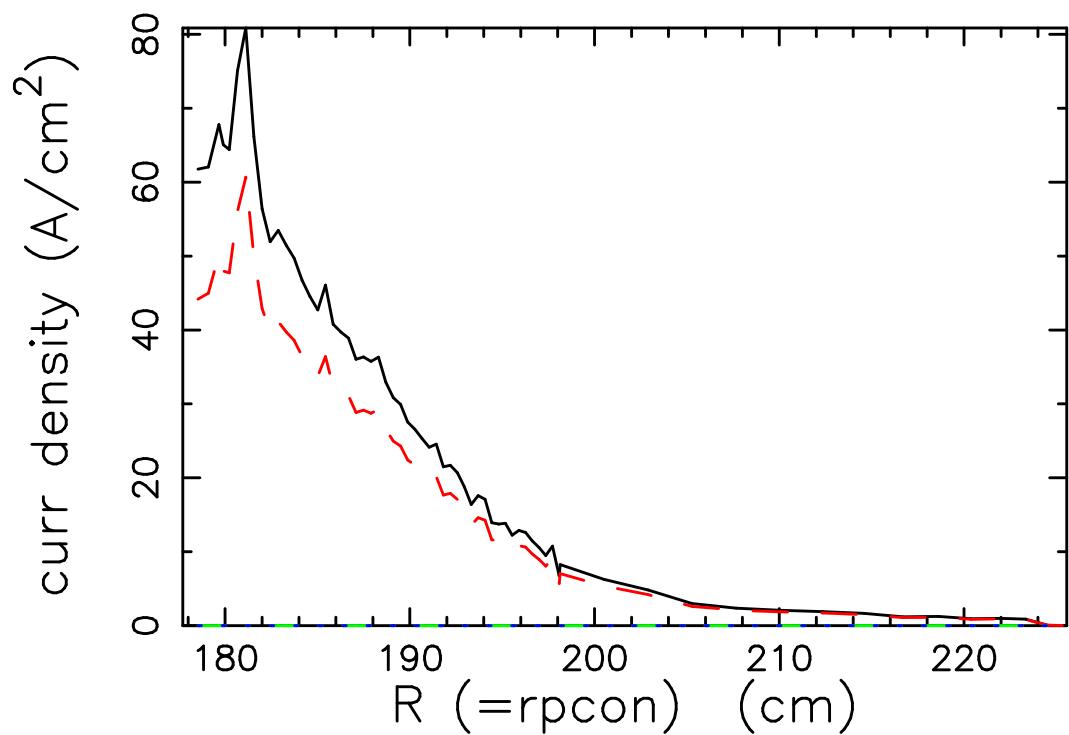
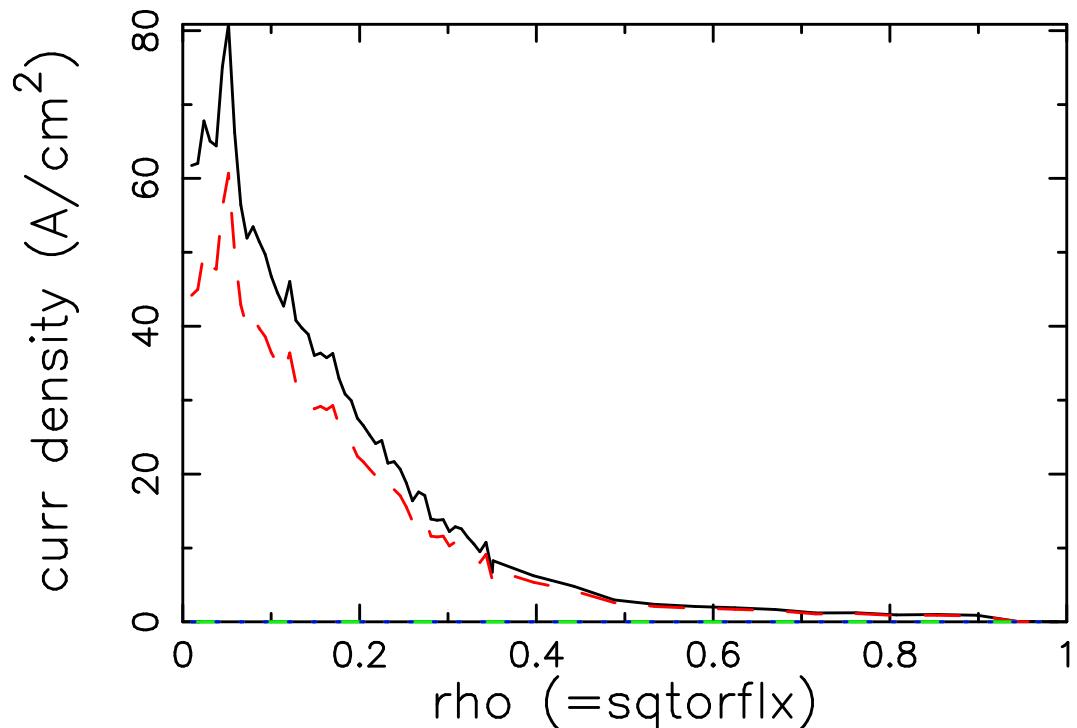
Solid/thin: From Integral over f (curr()) -1.539E+04A

Solid/bold: From All the above together -1.539E+04A



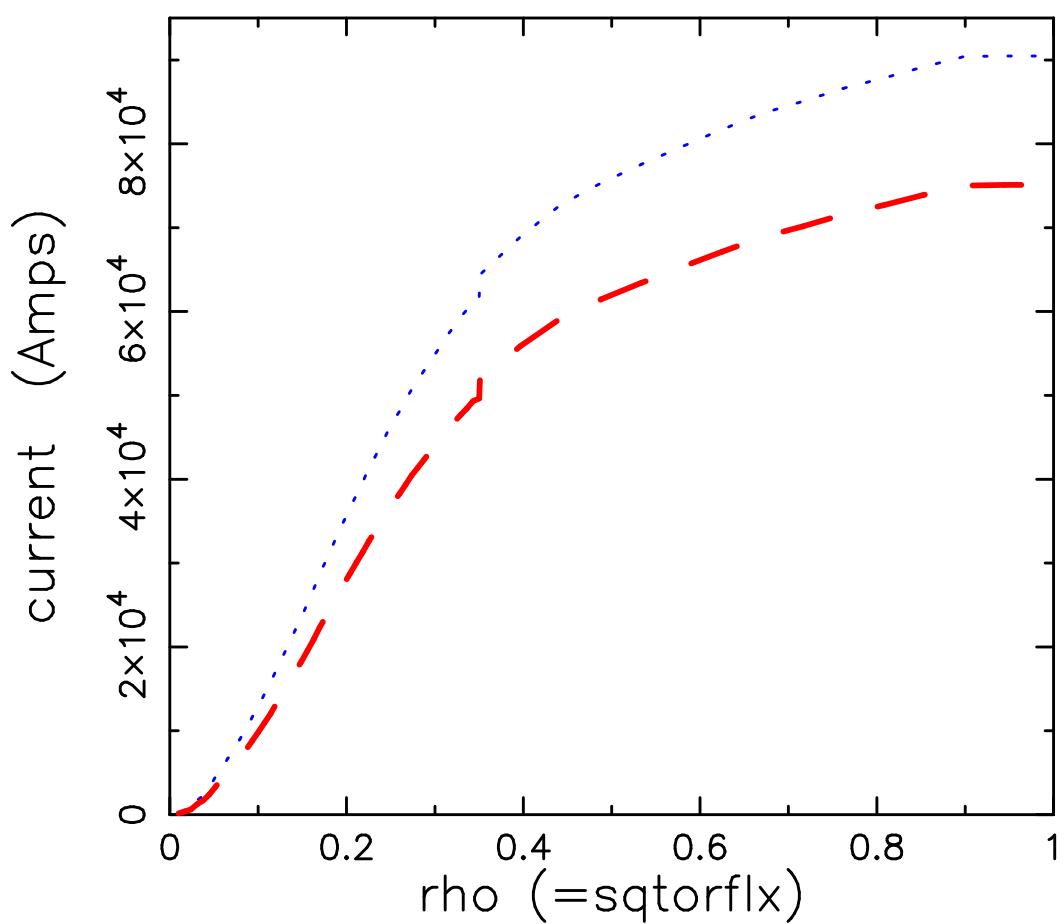
CURRENT (AMPS/CM²)

fi [solid] = 9.048E+04 fi+e[---] = 7.510E+04
 bs_e[---] = 0.000E+00 bs_i[.....] = 0.000E+00 Amps



CURRENT (AMPS)
(INTEGRATED UP TO RHO or PSI)

Blue/dotted: using currz(k,lr) over ionic general species
Red/dashed: using curr(k,lr) over all general species



SOURCE POWER: (WATTS/CC)

| rho | NBI(orKO)+RF | NBI(or KO) | RF(1) | RF(2) | RF(3) |
|-----------|--------------|-------------|----------------------------------|-----------|-------|
| rho | (sorpwt) | (sorpw_nbi) | (sorpw_rf for gen.species 1,2,3) | | |
| 1.000E-02 | 1.038E+00 | 1.038E+00 | 0.000E+00 | 0.000E+00 | |
| 1.694E-02 | 1.051E+00 | 1.051E+00 | 0.000E+00 | 0.000E+00 | |
| 2.388E-02 | 1.146E+00 | 1.146E+00 | 0.000E+00 | 0.000E+00 | |
| 3.082E-02 | 3.043E+00 | 1.121E+00 | 1.922E+00 | 9.595E-06 | |
| 3.776E-02 | 2.415E+00 | 1.077E+00 | 1.338E+00 | 6.045E-05 | |
| 4.469E-02 | 2.217E+00 | 1.051E+00 | 1.166E+00 | 4.656E-05 | |
| 5.163E-02 | 2.284E+00 | 1.024E+00 | 1.260E+00 | 6.700E-05 | |
| 5.857E-02 | 1.414E+00 | 1.043E+00 | 3.712E-01 | 7.025E-05 | |
| 6.551E-02 | 1.110E+00 | 1.008E+00 | 1.021E-01 | 6.007E-05 | |
| 7.245E-02 | 1.360E+00 | 9.839E-01 | 3.762E-01 | 3.425E-04 | |
| 7.939E-02 | 1.122E+00 | 9.975E-01 | 1.241E-01 | 3.395E-04 | |
| 8.633E-02 | 1.082E+00 | 9.639E-01 | 1.180E-01 | 3.029E-04 | |
| 9.327E-02 | 1.197E+00 | 9.710E-01 | 2.256E-01 | 8.932E-04 | |
| 1.002E-01 | 9.883E-01 | 9.335E-01 | 5.411E-02 | 6.691E-04 | |
| 1.071E-01 | 1.033E+00 | 8.840E-01 | 1.484E-01 | 6.564E-04 | |
| 1.141E-01 | 1.276E+00 | 8.841E-01 | 3.885E-01 | 3.204E-03 | |
| 1.210E-01 | 1.048E+00 | 9.259E-01 | 1.201E-01 | 2.291E-03 | |
| 1.280E-01 | 8.947E-01 | 8.558E-01 | 3.717E-02 | 1.684E-03 | |
| 1.349E-01 | 9.553E-01 | 8.535E-01 | 9.959E-02 | 2.245E-03 | |
| 1.418E-01 | 8.472E-01 | 8.369E-01 | 8.640E-03 | 1.674E-03 | |
| 1.488E-01 | 8.177E-01 | 8.134E-01 | 3.062E-03 | 1.241E-03 | |
| 1.557E-01 | 8.114E-01 | 8.102E-01 | 1.906E-04 | 9.477E-04 | |
| 1.627E-01 | 7.926E-01 | 7.918E-01 | 3.508E-06 | 7.597E-04 | |
| 1.696E-01 | 7.980E-01 | 7.974E-01 | 2.997E-08 | 6.183E-04 | |
| 1.765E-01 | 7.835E-01 | 7.830E-01 | 9.632E-11 | 5.086E-04 | |
| 1.835E-01 | 7.266E-01 | 7.262E-01 | 1.072E-12 | 4.229E-04 | |
| 1.904E-01 | 7.149E-01 | 7.145E-01 | 2.158E-13 | 3.551E-04 | |
| 1.973E-01 | 6.901E-01 | 6.898E-01 | 5.775E-14 | 2.995E-04 | |
| 2.043E-01 | 6.769E-01 | 6.766E-01 | 1.687E-14 | 2.544E-04 | |
| 2.112E-01 | 6.518E-01 | 6.516E-01 | 2.502E-14 | 2.165E-04 | |
| 2.182E-01 | 6.442E-01 | 6.440E-01 | 1.706E-13 | 1.848E-04 | |
| 2.251E-01 | 6.231E-01 | 6.229E-01 | 1.177E-12 | 1.598E-04 | |
| 2.320E-01 | 6.003E-01 | 6.002E-01 | 7.585E-12 | 1.377E-04 | |
| 2.390E-01 | 5.882E-01 | 5.881E-01 | 4.399E-10 | 1.202E-04 | |
| 2.459E-01 | 5.824E-01 | 5.823E-01 | 5.260E-08 | 1.029E-04 | |
| 2.529E-01 | 5.647E-01 | 5.646E-01 | 3.113E-06 | 9.126E-05 | |
| 2.598E-01 | 5.441E-01 | 5.439E-01 | 8.069E-05 | 8.060E-05 | |
| 2.667E-01 | 5.266E-01 | 5.257E-01 | 8.276E-04 | 6.933E-05 | |
| 2.737E-01 | 5.511E-01 | 5.447E-01 | 6.337E-03 | 5.964E-05 | |
| 2.806E-01 | 5.386E-01 | 5.151E-01 | 2.345E-02 | 5.570E-05 | |

| | | | | |
|-----------|-----------|-----------|-----------|-----------|
| 2.876E-01 | 5.292E-01 | 4.871E-01 | 4.209E-02 | 4.899E-05 |
| 2.945E-01 | 1.603E+00 | 4.892E-01 | 1.114E+00 | 4.495E-05 |
| 3.014E-01 | 1.494E+00 | 4.957E-01 | 9.984E-01 | 5.445E-05 |
| 3.084E-01 | 1.380E+00 | 4.959E-01 | 8.840E-01 | 7.547E-05 |
| 3.153E-01 | 1.357E+00 | 4.647E-01 | 8.921E-01 | 1.048E-04 |
| 3.222E-01 | 1.187E+00 | 4.666E-01 | 7.202E-01 | 1.486E-04 |
| 3.292E-01 | 5.405E-01 | 4.329E-01 | 1.074E-01 | 1.829E-04 |
| 3.361E-01 | 5.081E-01 | 4.585E-01 | 4.947E-02 | 1.688E-04 |
| 3.431E-01 | 4.637E-01 | 4.473E-01 | 1.624E-02 | 1.511E-04 |
| 3.500E-01 | 3.940E-01 | 3.904E-01 | 3.481E-03 | 1.377E-04 |
| 3.510E-01 | 4.170E-01 | 4.165E-01 | 3.634E-04 | 1.237E-04 |
| 3.966E-01 | 3.734E-01 | 3.733E-01 | 1.053E-06 | 6.616E-05 |
| 4.423E-01 | 3.286E-01 | 3.285E-01 | 1.391E-06 | 3.484E-05 |
| 4.879E-01 | 2.743E-01 | 2.743E-01 | 3.699E-06 | 1.910E-05 |
| 5.336E-01 | 2.498E-01 | 2.498E-01 | 1.960E-05 | 1.088E-05 |
| 5.792E-01 | 2.550E-01 | 2.282E-01 | 2.672E-02 | 6.635E-06 |
| 6.249E-01 | 2.075E-01 | 2.074E-01 | 4.919E-05 | 4.458E-06 |
| 6.705E-01 | 1.291E-01 | 1.291E-01 | 5.290E-11 | 3.115E-06 |
| 7.161E-01 | 9.255E-02 | 9.255E-02 | 4.239E-12 | 2.164E-06 |
| 7.618E-01 | 4.980E-02 | 4.980E-02 | 2.720E-13 | 1.490E-06 |
| 8.074E-01 | 1.692E-02 | 1.692E-02 | 3.474E-21 | 1.324E-06 |
| 8.531E-01 | 1.820E-02 | 1.819E-02 | 3.054E-08 | 1.303E-06 |
| 8.987E-01 | 1.800E-02 | 1.794E-02 | 6.601E-05 | 9.487E-07 |
| 9.444E-01 | 3.221E-03 | 3.221E-03 | 7.073E-10 | 1.598E-07 |
| 9.900E-01 | 1.204E-18 | 0.000E+00 | 1.164E-18 | 3.951E-20 |

Power integr.over rad. (RF+NBI(or KO), all gen.species)= 4.4778E+06Watts
 Power from NBI(or KO) (sorpw_nbii)= 3.8507E+06Watts
 Power from RF (sorpw_rfi) Gen.species no.1 = 6.2586E+05Watts
 Power from RF (sorpw_rfi) Gen.species no.2 = 1.2149E+03Watts

DEPOSITED POWER: (WATTS/CC)

| rho | TOTAL | RF1 | RF2 | RF3 | RF4 | RF5 |
|-------|----------|---|----------|-----------|----------|-----------|
| rho | (powrft) | (powrf(*,harmonic) for harmonics = 1-5) | | | | |
| 0.010 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.017 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.024 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.031 | 0.18E+01 | 0.00E+00 | 0.00E+00 | 0.19E-60 | 0.18E+01 | 0.10E-60 |
| 0.038 | 0.13E+01 | 0.00E+00 | 0.00E+00 | 0.14E-68 | 0.13E+01 | 0.40E-69 |
| 0.045 | 0.12E+01 | 0.00E+00 | 0.00E+00 | 0.53E-85 | 0.12E+01 | 0.17E-101 |
| 0.052 | 0.13E+01 | 0.00E+00 | 0.00E+00 | 0.23E-60 | 0.13E+01 | 0.10E-61 |
| 0.059 | 0.37E+00 | 0.00E+00 | 0.00E+00 | 0.50E-72 | 0.37E+00 | 0.52E-76 |
| 0.066 | 0.10E+00 | 0.00E+00 | 0.00E+00 | 0.56E-71 | 0.10E+00 | 0.33E-80 |
| 0.072 | 0.37E+00 | 0.00E+00 | 0.20E-84 | 0.50E-49 | 0.37E+00 | -0.33E-48 |
| 0.079 | 0.12E+00 | 0.13-128 | 0.38-103 | 0.13E-56 | 0.12E+00 | -0.55E-58 |
| 0.086 | 0.12E+00 | 0.62-132 | 0.10-104 | 0.32E-46 | 0.12E+00 | 0.41E-37 |
| 0.093 | 0.22E+00 | 0.13-115 | 0.59E-93 | 0.66E-39 | 0.22E+00 | 0.23E-27 |
| 0.100 | 0.55E-01 | 0.35-131 | 0.36-106 | 0.22E-49 | 0.54E-01 | 0.35E-23 |
| 0.107 | 0.15E+00 | 0.14-127 | 0.78-107 | 0.26E-34 | 0.15E+00 | 0.80E-20 |
| 0.114 | 0.39E+00 | 0.26-108 | 0.25E-90 | 0.21E-30 | 0.38E+00 | 0.32E-15 |
| 0.121 | 0.12E+00 | 0.20-103 | 0.36E-89 | 0.12E-41 | 0.12E+00 | 0.00E+00 |
| 0.128 | 0.39E-01 | 0.19-101 | 0.21E-85 | 0.30E-34 | 0.37E-01 | -0.17E-15 |
| 0.135 | 0.10E+00 | 0.10E-93 | 0.11E-81 | 0.83E-25 | 0.99E-01 | 0.80E-14 |
| 0.142 | 0.10E-01 | 0.26-102 | 0.30E-89 | 0.84E-36 | 0.87E-02 | 0.33E-14 |
| 0.149 | 0.43E-02 | 0.71-107 | 0.11E-92 | 0.11E-34 | 0.31E-02 | 0.52E-14 |
| 0.156 | 0.11E-02 | 0.80-109 | 0.12E-93 | 0.86E-35 | 0.19E-03 | 0.64E-15 |
| 0.163 | 0.77E-03 | 0.93-109 | 0.94E-93 | 0.15E-35 | 0.36E-05 | 0.96E-17 |
| 0.170 | 0.62E-03 | 0.48-108 | 0.17E-91 | 0.56E-37 | 0.31E-07 | 0.42E-18 |
| 0.177 | 0.51E-03 | 0.35-107 | 0.38E-90 | -0.22E-40 | 0.99E-10 | 0.92E-19 |
| 0.183 | 0.42E-03 | 0.00E+00 | 0.45E-92 | -0.30E-46 | 0.11E-11 | 0.90E-18 |
| 0.190 | 0.36E-03 | 0.00E+00 | 0.00E+00 | 0.32E-81 | 0.22E-12 | 0.17E-16 |
| 0.197 | 0.30E-03 | 0.00E+00 | 0.00E+00 | 0.36E-27 | 0.59E-13 | 0.22E-15 |
| 0.204 | 0.26E-03 | 0.85-100 | 0.90E-84 | 0.36E-23 | 0.15E-13 | 0.26E-14 |
| 0.211 | 0.22E-03 | 0.23E-96 | 0.26E-81 | 0.48E-20 | 0.33E-14 | 0.22E-13 |
| 0.218 | 0.19E-03 | 0.19E-95 | 0.79E-81 | 0.62E-17 | 0.91E-15 | 0.17E-12 |
| 0.225 | 0.16E-03 | 0.16E-93 | 0.27E-79 | 0.41E-14 | 0.21E-15 | 0.12E-11 |
| 0.232 | 0.14E-03 | 0.50E-92 | 0.13E-77 | 0.19E-11 | 0.12E-15 | 0.58E-11 |
| 0.239 | 0.12E-03 | 0.45E-91 | 0.14E-76 | 0.42E-09 | 0.30E-14 | 0.30E-10 |
| 0.246 | 0.10E-03 | 0.12E-89 | 0.40E-75 | 0.54E-07 | 0.12E-12 | 0.13E-09 |
| 0.253 | 0.95E-04 | 0.28E-89 | 0.62E-75 | 0.32E-05 | 0.44E-11 | 0.47E-09 |
| 0.260 | 0.16E-03 | 0.12E-88 | 0.12E-74 | 0.82E-04 | 0.69E-10 | 0.16E-08 |
| 0.267 | 0.90E-03 | 0.49E-87 | 0.12E-73 | 0.83E-03 | 0.40E-09 | 0.77E-08 |
| 0.274 | 0.64E-02 | 0.35E-99 | 0.11E-85 | 0.64E-02 | 0.13E-08 | 0.35E-07 |
| 0.281 | 0.24E-01 | 0.00E+00 | 0.32E-96 | 0.23E-01 | 0.16E-08 | 0.23E-06 |

| | | | | | | |
|-------|----------|-----------|-----------|-----------|-----------|----------|
| 0.288 | 0.41E-01 | 0.00E+00 | 0.19-116 | 0.41E-01 | 0.81E-09 | 0.13E-05 |
| 0.294 | 0.13E+01 | 0.00E+00 | 0.44E-39 | 0.13E+01 | 0.57E-09 | 0.40E-05 |
| 0.301 | 0.10E+01 | 0.25E-56 | 0.14E-39 | 0.10E+01 | 0.12E-09 | 0.46E-05 |
| 0.308 | 0.12E+01 | 0.21E-89 | 0.52E-73 | 0.12E+01 | 0.13E-09 | 0.12E-04 |
| 0.315 | 0.89E+00 | 0.42E-80 | 0.69E-64 | 0.89E+00 | 0.55E-10 | 0.70E-05 |
| 0.322 | 0.11E+01 | 0.61E-80 | 0.25E-63 | 0.11E+01 | 0.43E-10 | 0.63E-05 |
| 0.329 | 0.11E+00 | 0.33E-85 | -0.26E-64 | 0.11E+00 | 0.19E-11 | 0.74E-05 |
| 0.336 | 0.49E-01 | 0.91E-85 | -0.29E-62 | 0.49E-01 | 0.50E-11 | 0.51E-05 |
| 0.343 | 0.16E-01 | 0.24E-91 | -0.53E-62 | 0.16E-01 | 0.12E-11 | 0.28E-05 |
| 0.350 | 0.36E-02 | 0.49E-97 | 0.10E-61 | 0.35E-02 | 0.43E-13 | 0.18E-05 |
| 0.351 | 0.49E-03 | 0.28E-90 | -0.10E-57 | 0.36E-03 | 0.48E-16 | 0.18E-05 |
| 0.397 | 0.67E-04 | 0.53-130 | 0.81E-57 | 0.14E-08 | 0.48E-28 | 0.11E-05 |
| 0.442 | 0.36E-04 | 0.00E+00 | 0.00E+00 | 0.38E-34 | 0.96E-33 | 0.14E-05 |
| 0.488 | 0.23E-04 | 0.30-194 | 0.12E-17 | -0.26E-54 | 0.12E-30 | 0.37E-05 |
| 0.534 | 0.31E-04 | 0.67-170 | 0.19E-04 | -0.13E-42 | 0.24E-14 | 0.26E-06 |
| 0.579 | 0.18E-01 | 0.12-125 | 0.18E-01 | -0.29E-35 | -0.52E-11 | 0.30E-06 |
| 0.625 | 0.54E-04 | 0.15-118 | 0.49E-04 | 0.44E-60 | -0.25E-19 | 0.18E-06 |
| 0.670 | 0.31E-05 | 0.00E+00 | 0.14E-12 | 0.00E+00 | -0.13E-48 | 0.46E-11 |
| 0.716 | 0.22E-05 | 0.00E+00 | 0.34E-52 | 0.00E+00 | 0.00E+00 | 0.70E-12 |
| 0.762 | 0.15E-05 | 0.46E-55 | 0.30-108 | 0.14-208 | 0.76E-85 | 0.22E-12 |
| 0.807 | 0.13E-05 | 0.39E-20 | 0.32-184 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.853 | 0.13E-05 | 0.31E-07 | 0.13-285 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.899 | 0.41E-05 | 0.31E-05 | 0.32-249 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.944 | 0.16E-06 | 0.25E-09 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.990 | 0.41E-19 | -0.58E-25 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

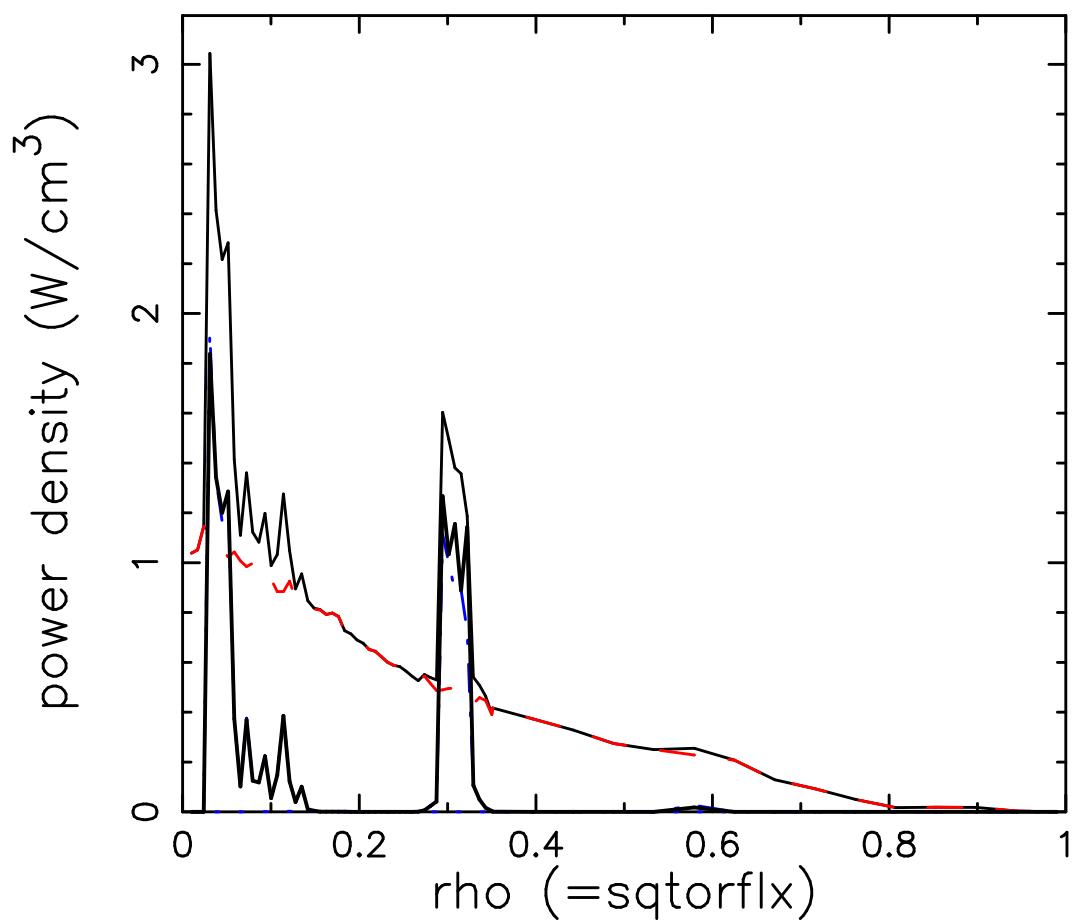
Power sources integr. over rad. (RF+NBI, all gen.species)= 4.4778E+06W
 Power from intern ray diagnostic[powurf(0)]= 6.9992E+05W

| | | | |
|---|---|---|------------|
| mode/harmonic krf, nharm(krf), powurf(krf)= | 1 | 5 | 4.1786E+00 |
| mode/harmonic krf, nharm(krf), powurf(krf)= | 2 | 6 | 1.9142E+04 |
| mode/harmonic krf, nharm(krf), powurf(krf)= | 3 | 7 | 5.3769E+05 |
| mode/harmonic krf, nharm(krf), powurf(krf)= | 4 | 8 | 1.4186E+05 |
| mode/harmonic krf, nharm(krf), powurf(krf)= | 5 | 9 | 1.1815E+01 |
| mode/harmonic krf, nharm(krf), powurf(krf)= | 6 | 0 | 1.2190E+03 |

Power by collisions (from ray data) = 0.0000E+00W

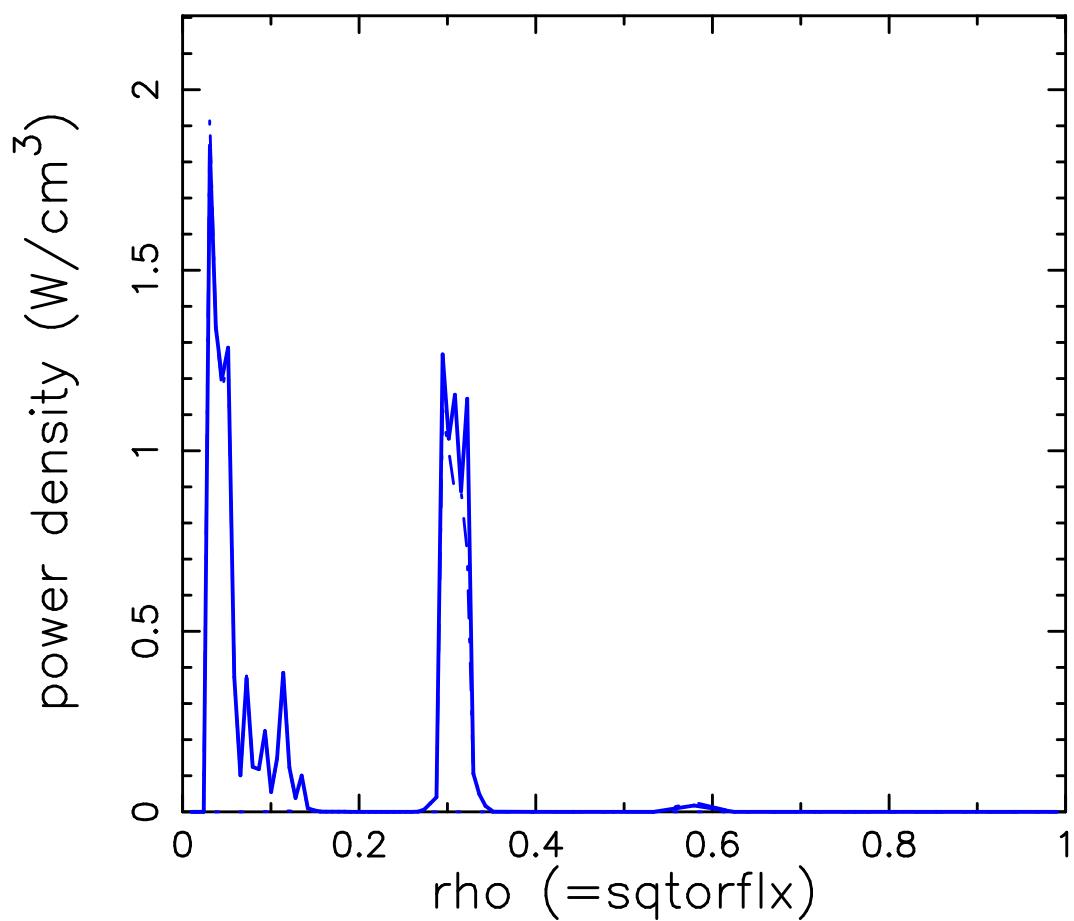
Power by linear damping (from ray data)= 0.0000E+00W

FSA SOURCE POWER DEN: (WATTS/CM³)
 Solid: NBI(or KO)+RF for all gen.sp.[sorpwt]
 Dashed: NBI (or KO) [sorpw_nbi]
 Solid-bold: total absorbed RF power [powrft]
 Other: RF general species (each) [sorpw_rf]

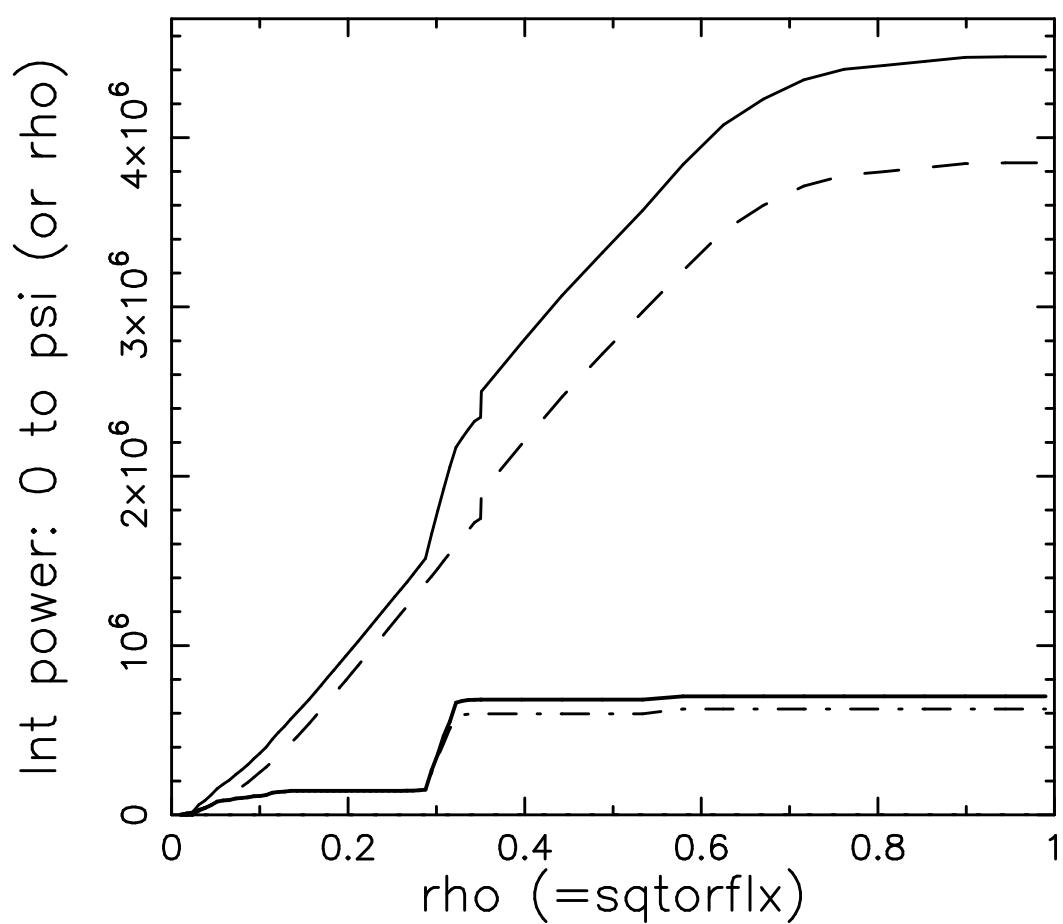


FSA RF POWER DEN: (WATTS/CM³)

Solid—bold: total absorbed RF power [powrft]
Other: RF general species (each) [sorpw_rf]

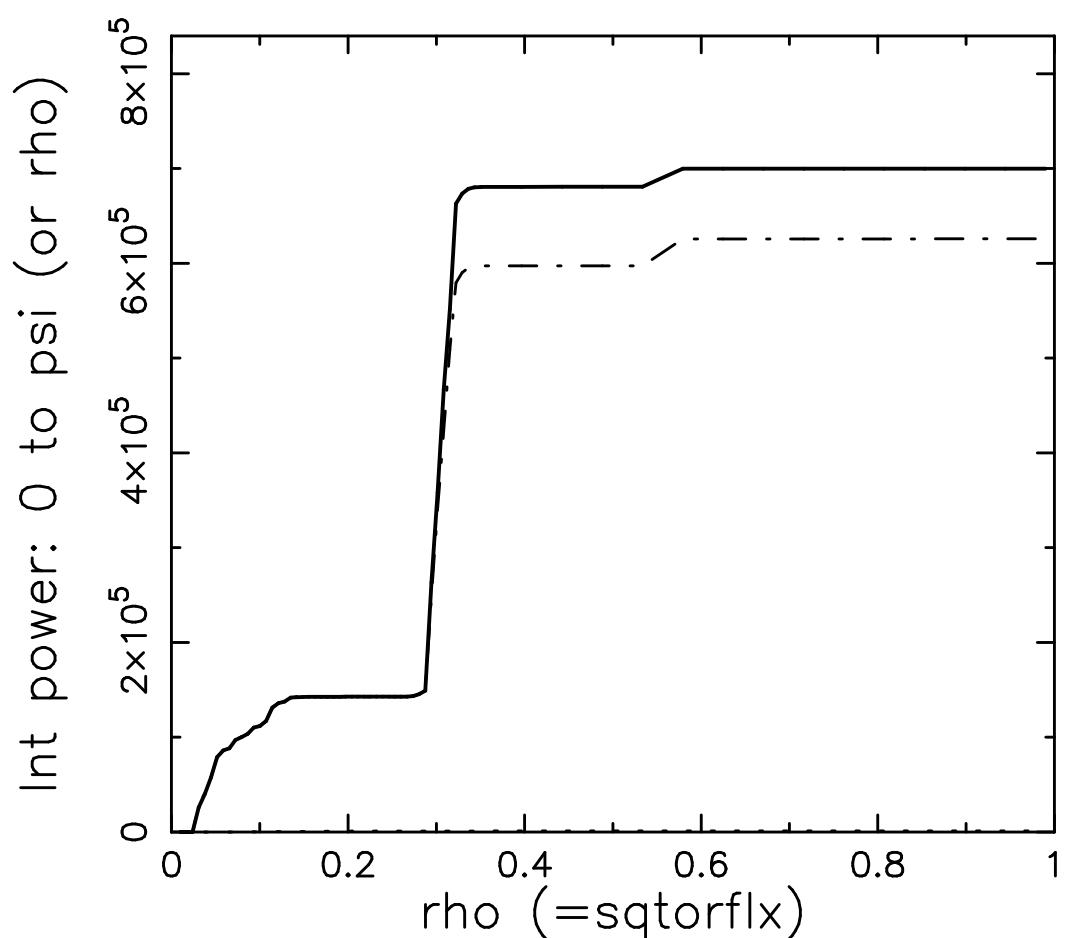


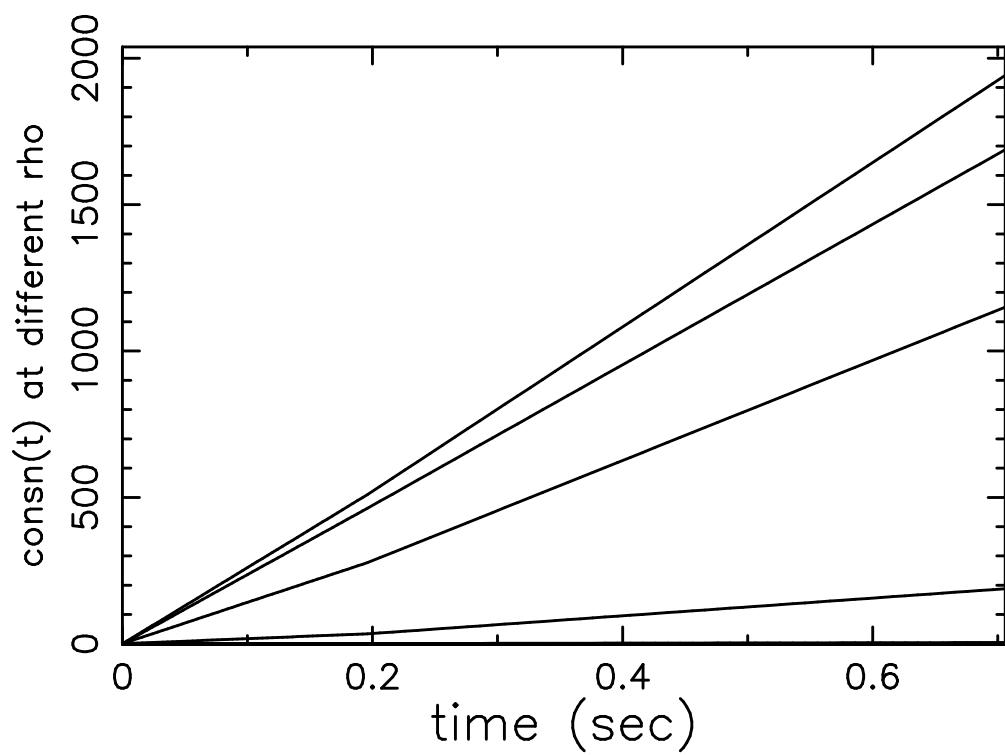
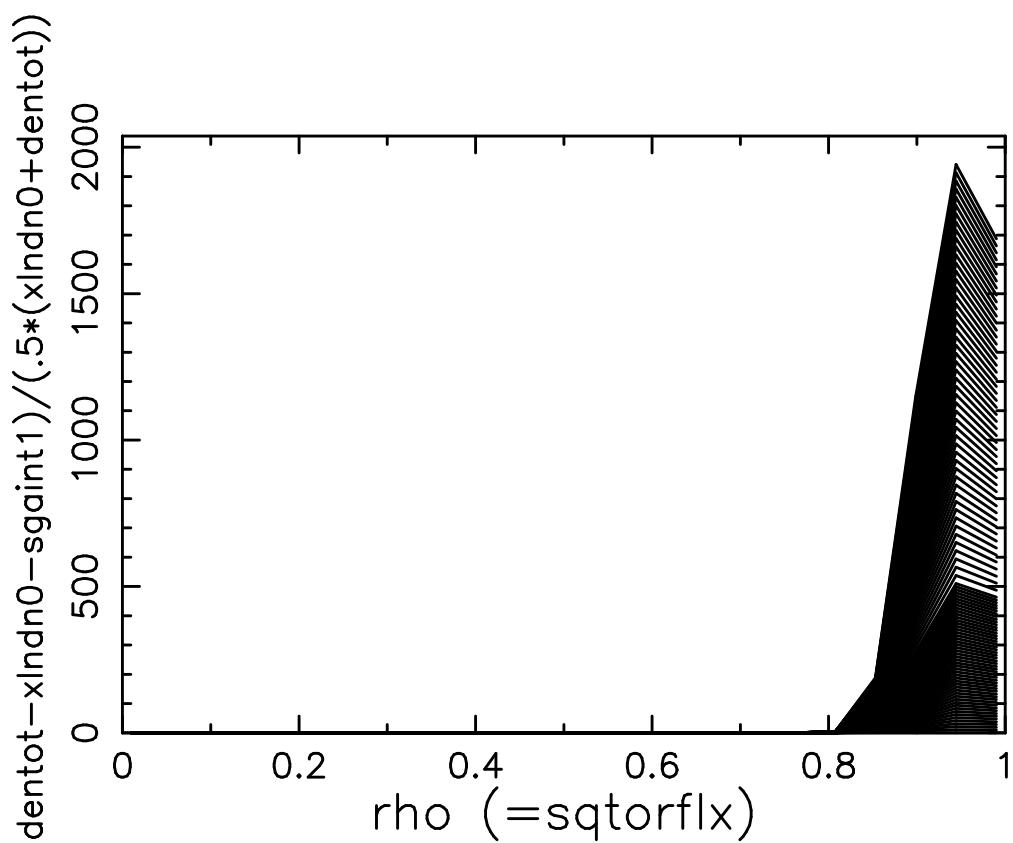
SOURCE POWER (integr. up to rho or psi) (WATTS)
 Solid: NBI(or KO)+RF for all gen.sp.[sorpwti]
 Dashed: NBI(or KO) [sorpw_nbii]
 Solid-bold: total absorbed RF [powurfi(*,0)]
 Other: RF general ions (each) [sorpw_rfi]



RF POWER (integr. up to rho or psi) (WATTS)

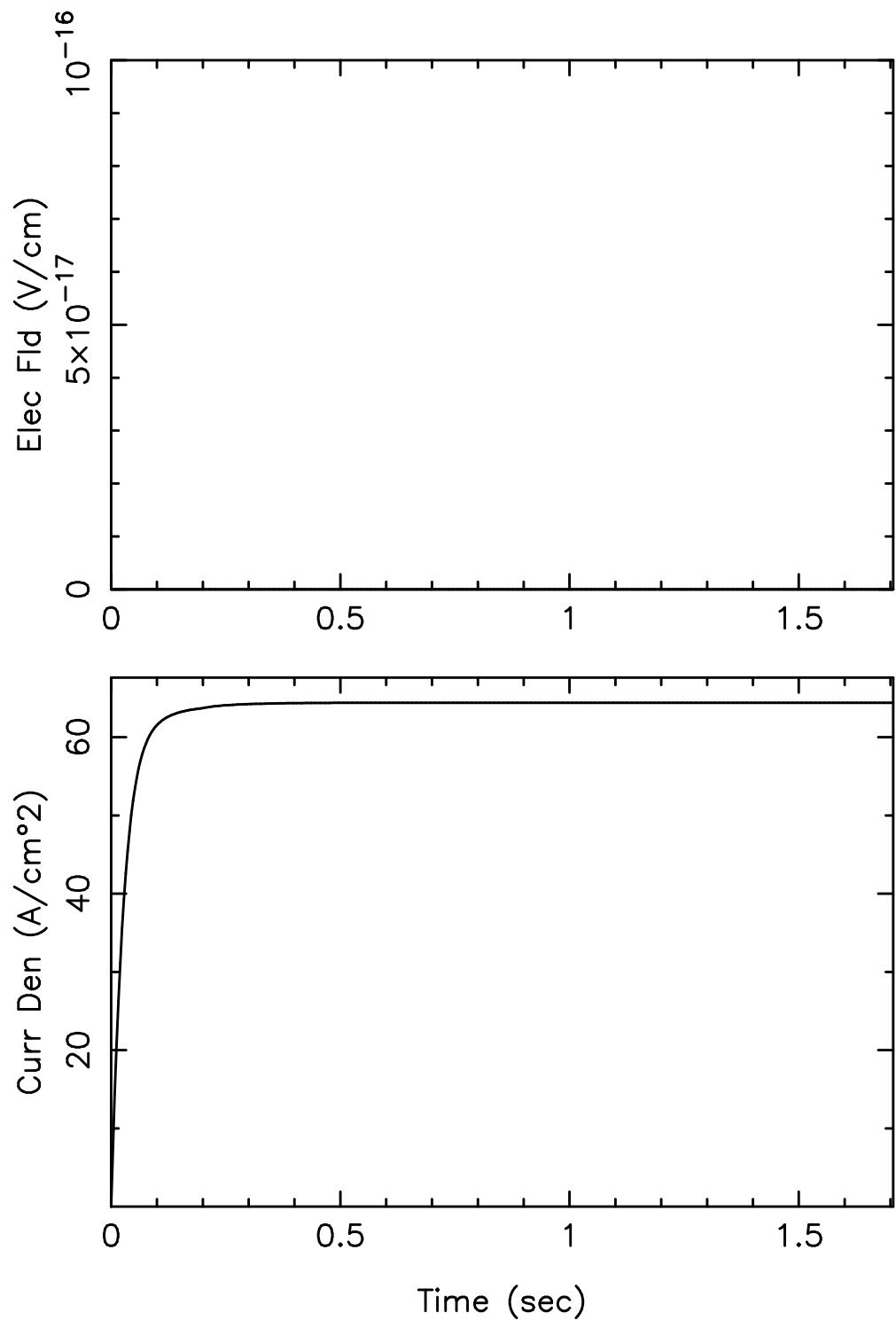
Solid—bold: total absorbed RF [powurfi(*,0)]
Other: RF general species (each) [sorpw_rfi]





LOCAL RADIAL QUANTITIES

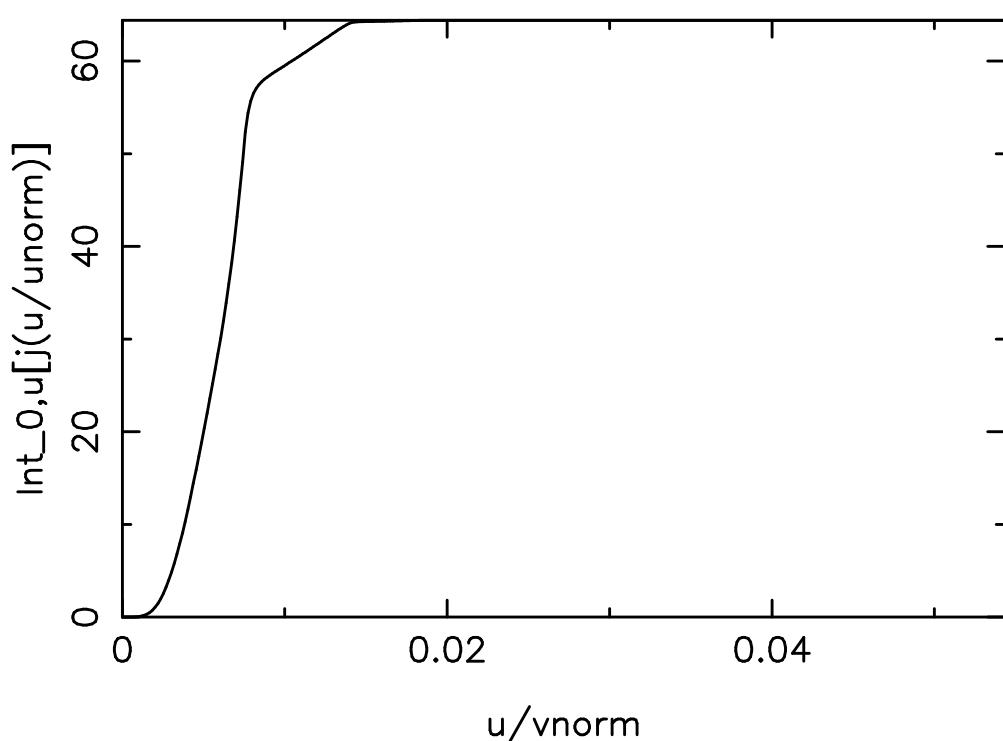
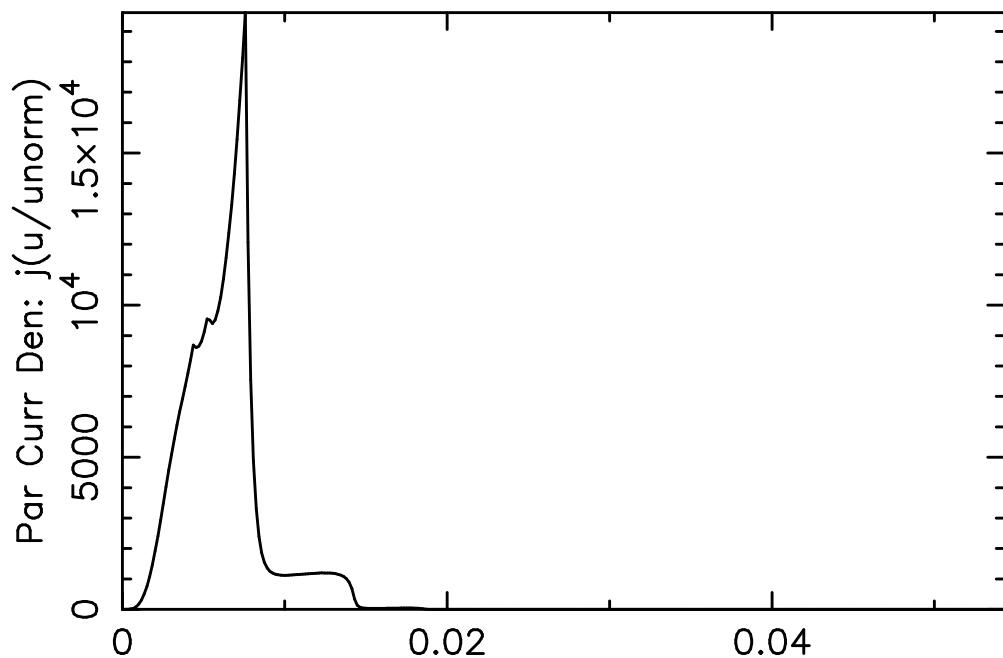
```
time step n= 200,      time= 1.7060E+00 secs
flux surf= 5      total flux surfs= 65
r/a= 3.776E-02      radial position (R)= 1.8022E+02 cms
rya= 3.776E-02      R=rpcon= 1.802E+02 cm
    enormi, enorme(=enorm) (kev) = 3250.000      300.000
vnorm/c = 1.2324136
vthe (sqrt(te/me))/c = 0.0931237
vthe/vnorm = 0.0755620
k= 1 vth(k)/vnorm = 0.0014402
k= 2 vth(k)/vnorm = 0.0755620
k= 3 vth(k)/vnorm = 0.0014402
k= 4 vth(k)/vnorm = 0.0001438
k= 5 vth(k)/vnorm = 0.0755620
```



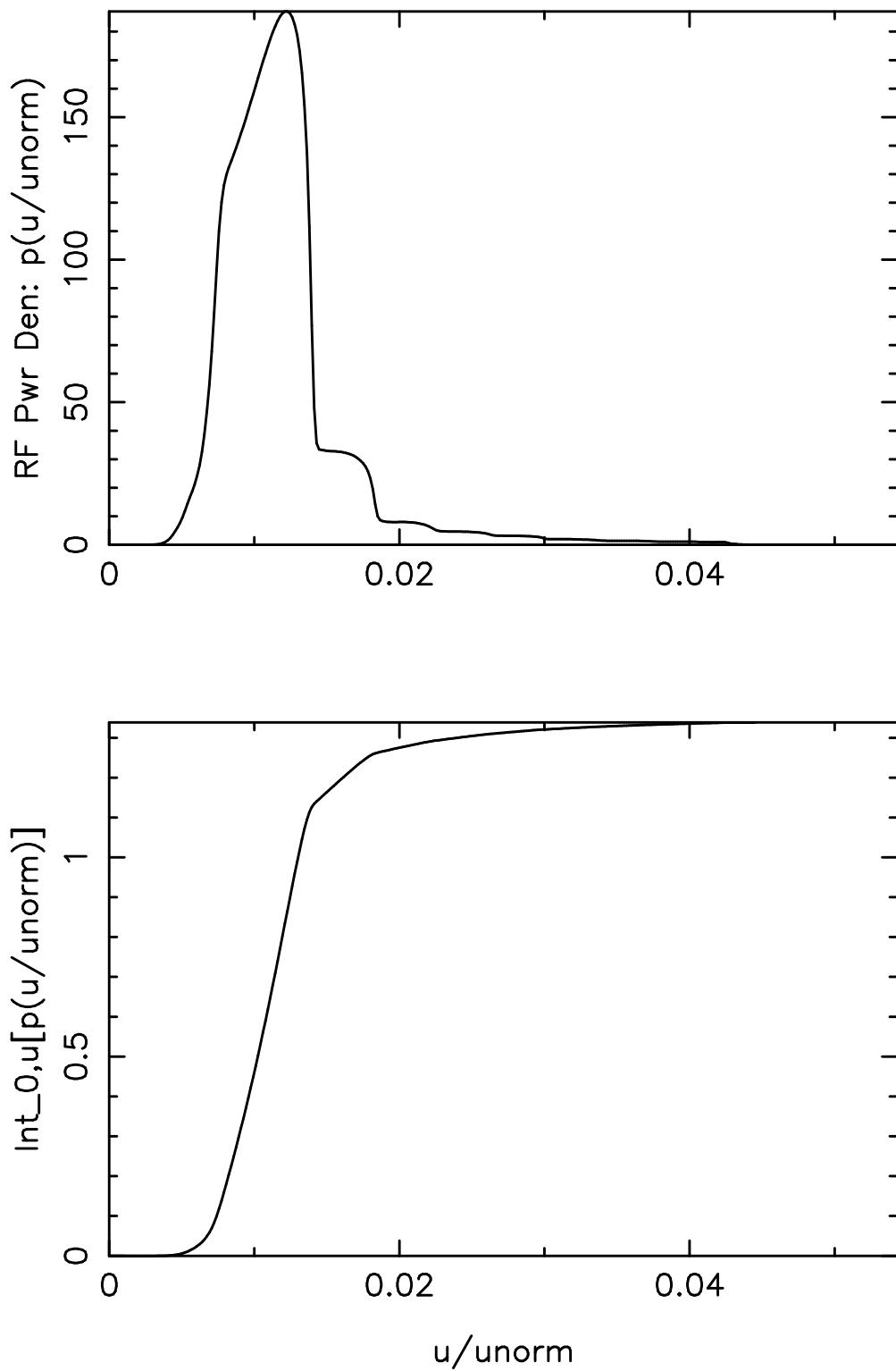
Electric field = 0.0000E+00 (V/cm)

FSA current den of species 1 = 6.4404E+01 Amps/cm**2

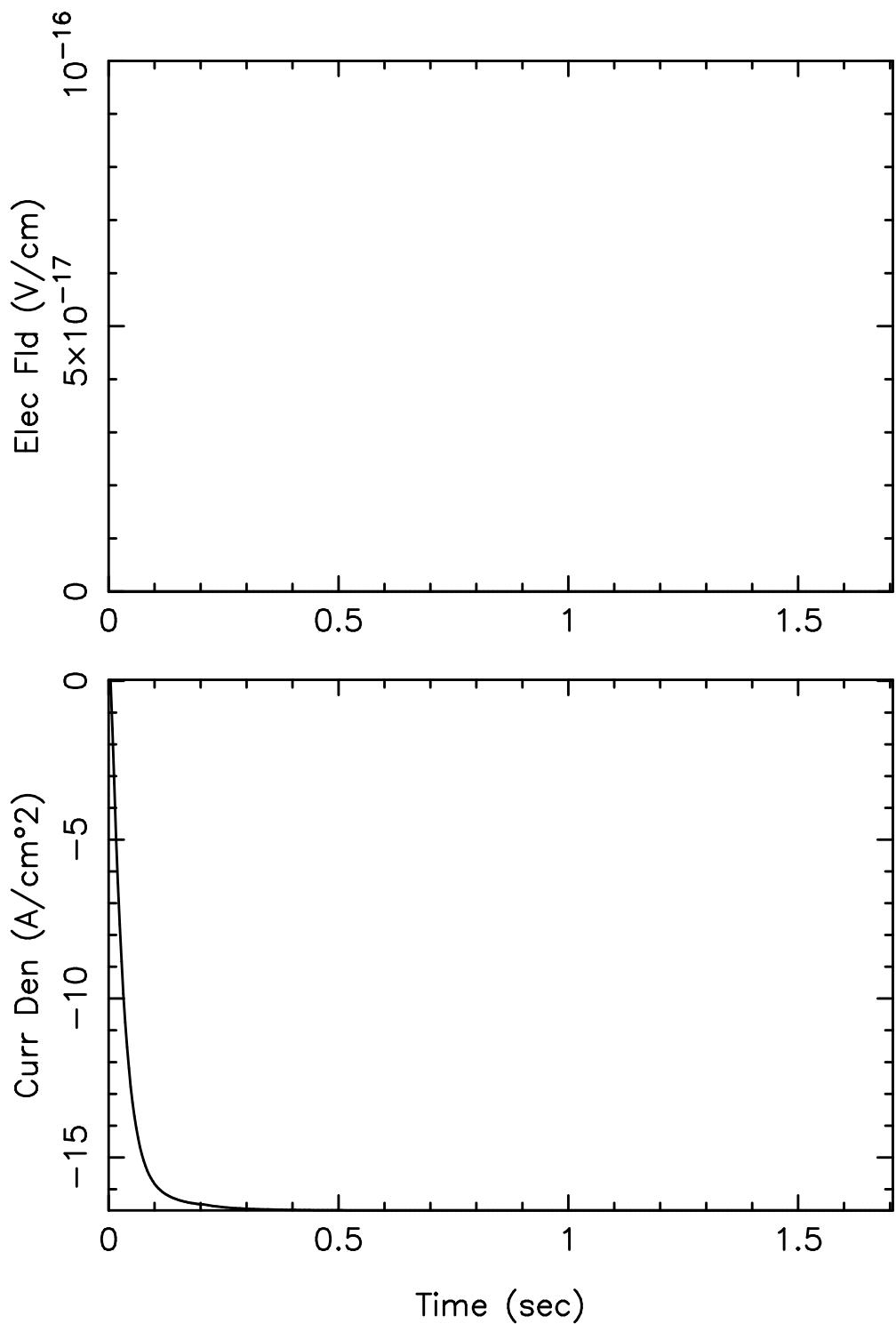
Current drive efficiency $j/(2\pi R \cdot prf)$ = 4.3117E-02 A/W



Species: 1 Current = $0.6440E+02$ Amps/cm 2

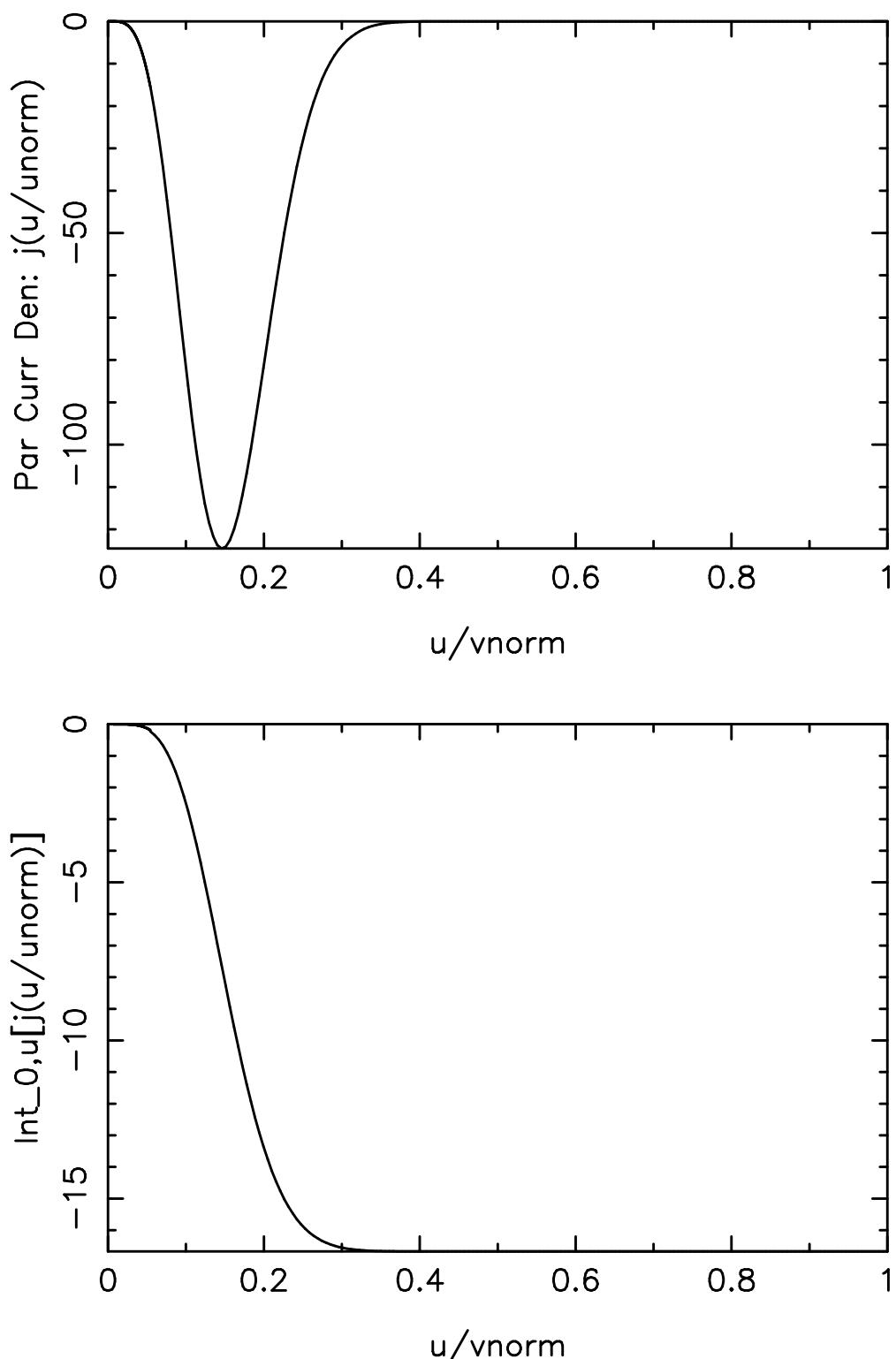


Species: 1 Power =0.1338E+01 Watts/cc

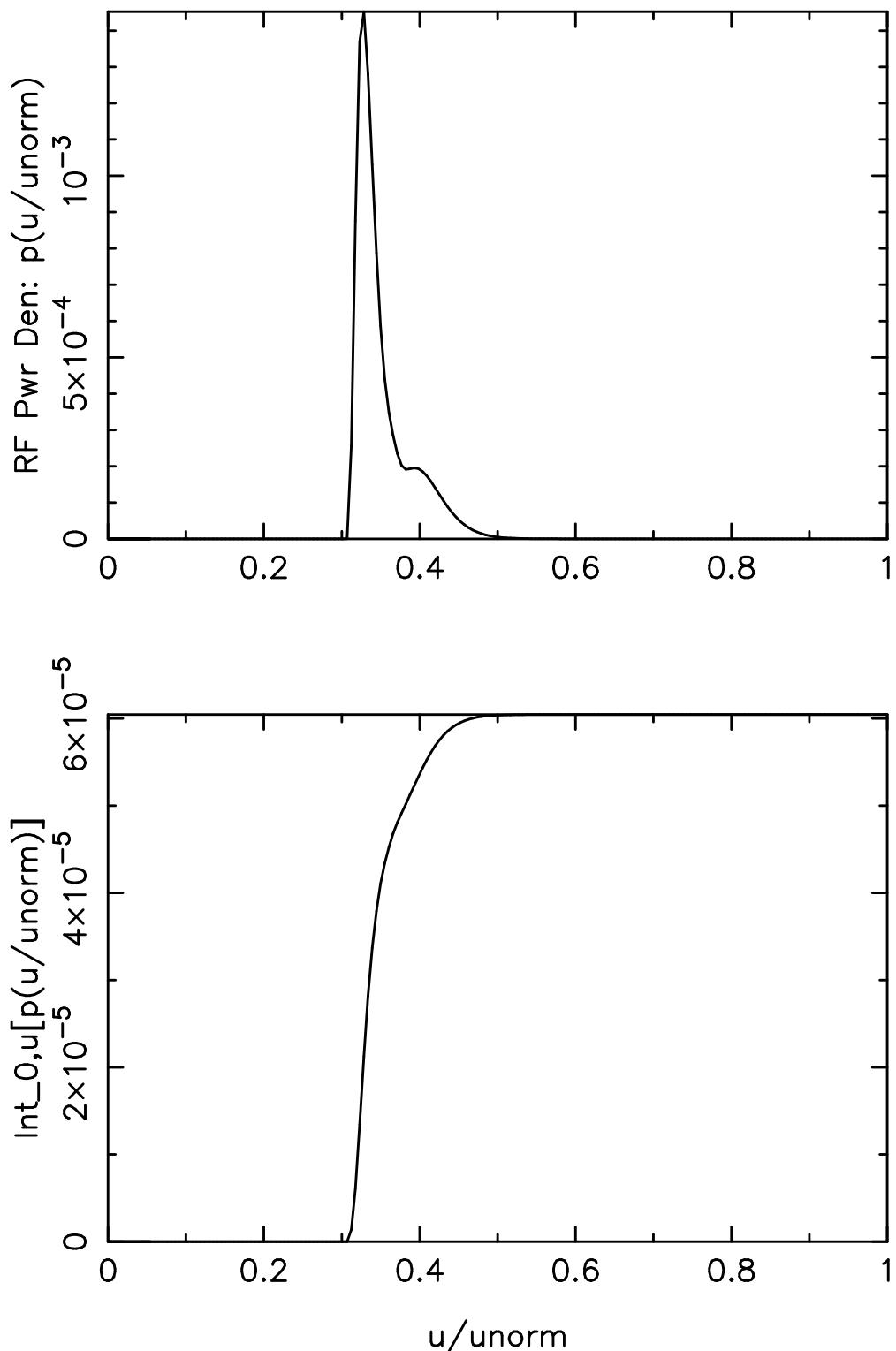


Electric field = 0.0000E+00 (V/cm)
 FSA current den of species 2 = -1.6670E+01 Amps/cm**2

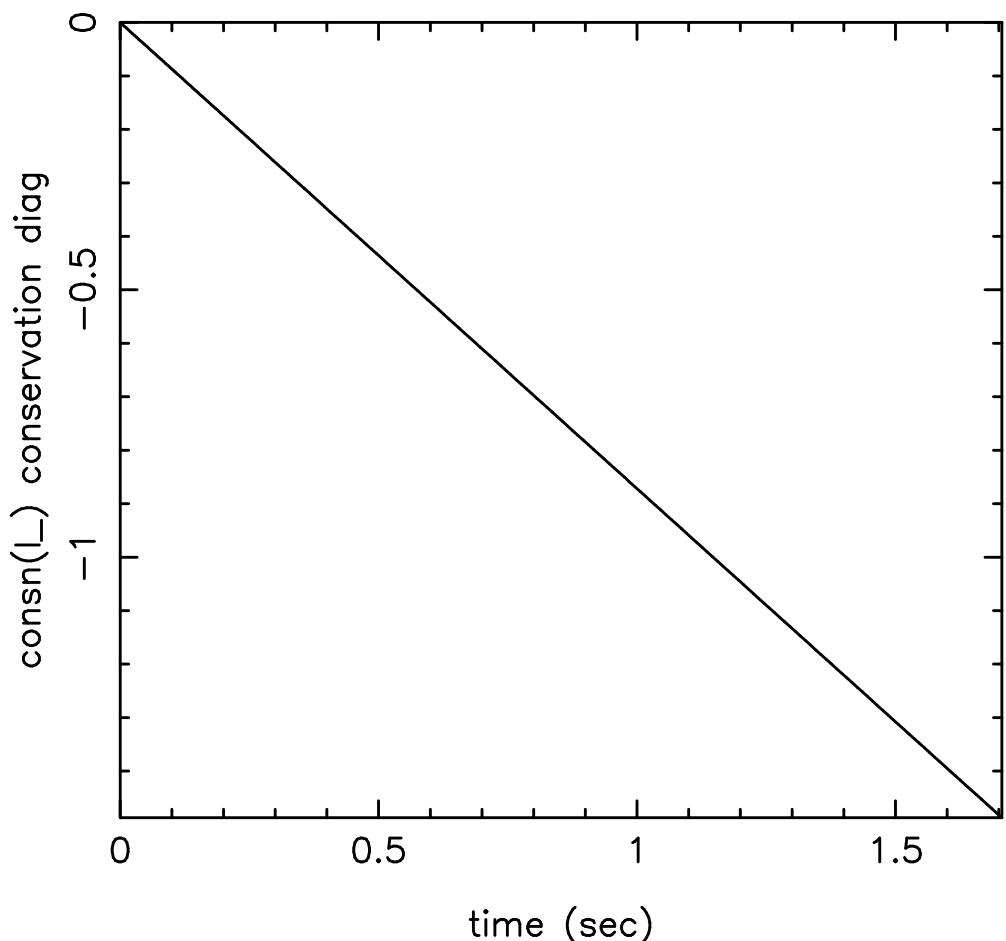
Current drive efficiency $j/(2\pi R \cdot \text{prf}) = -2.4706E+02$ A/W
 Electron current (units $ne \cdot q \cdot v_{th}(\text{kelec}, \text{lr}_\perp)$) = $-6.2280E-04$
 power (units: $ne \cdot v_{th}(\text{kelec}, \text{lr}_\perp)^2 \cdot me \cdot \nu_0$) = $1.8852E-08$
 efficiency (j/p) (Fisch 1978 units) = $-3.3036E+04$
 efficiency (j/p) ($e/(m \cdot c \cdot \nu_c)$ units) = $-2.8649E+02$
 $v_{th}(\text{kelec}, \text{lr}_\perp) = \sqrt{T/m} = 2.7918E+09$ cm/sec
 $\nu_0 = 7.5417E+04$ Hz



Species: 2 Current =-.1667E+02 Amps/cm²



Species: 2 Power = $0.6045\text{E-}04$ Watts/cc

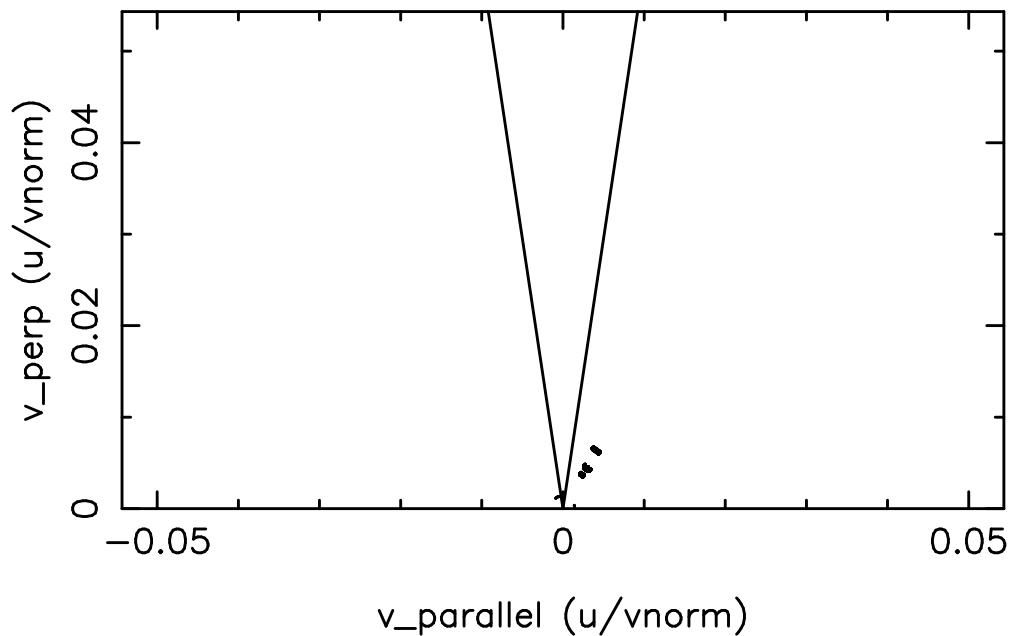


consn(L_{_}) = -1.4874E+00

Perfect conservation should yield machine accuracy,
or about 1.e-14:

time step (n) is 200 time= 1.7060E+00 secs
r/a= 3.7755E-02 radial position (R) = 1.8022E+02 cm

Species 1 Source Function (units: dist. f/sec)



time step n= 200 time= 1.71E+00 secs
 $r/a = 3.776E-02$ radial position (R)= 1.8022E+02 cm
 $rya = 3.776E-02$ R=rpcon= 1.8022E+02 cm, Surf# 5

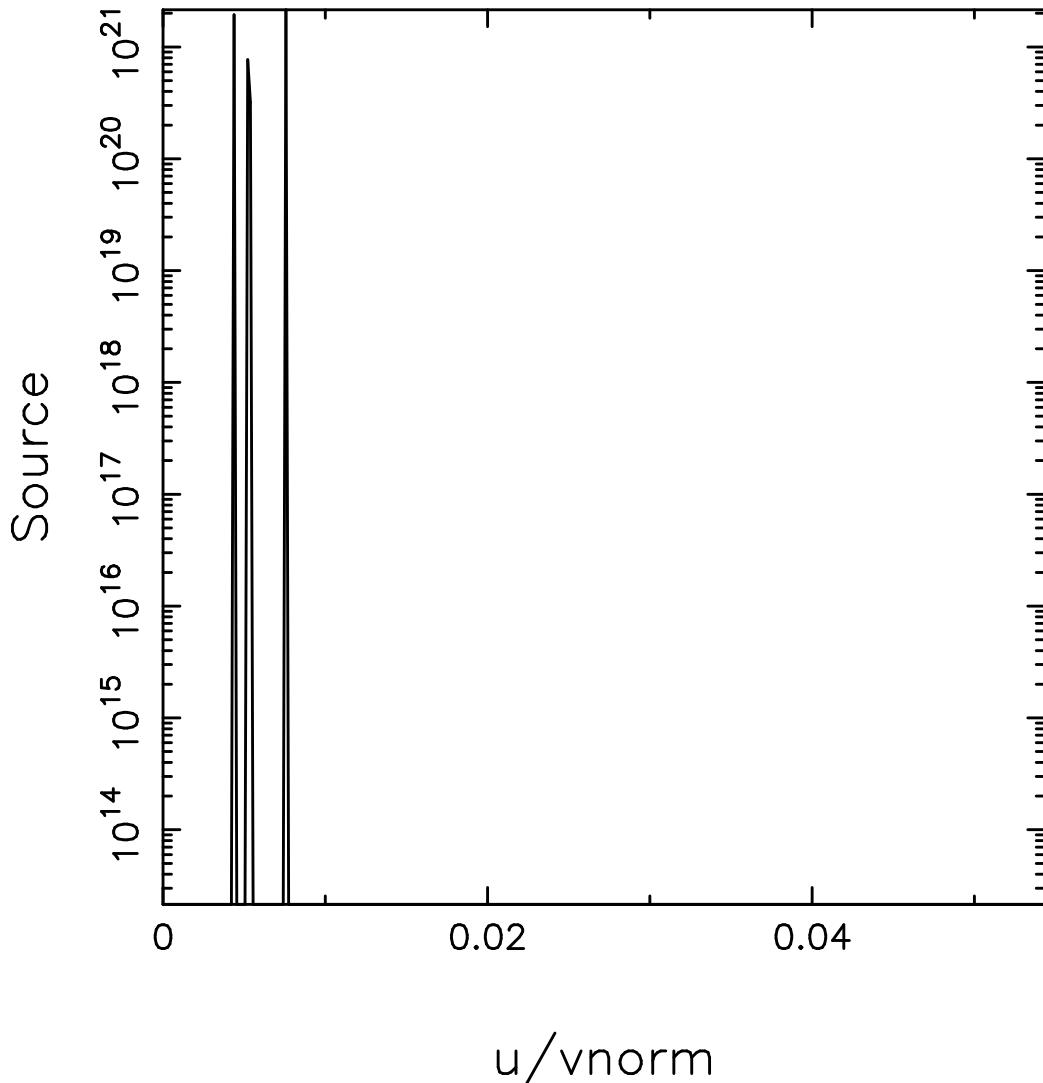
Particle source rate= 1.0447E+14 ptcls/cc/sec

Total source power [entr(..5..)]= 1.0764E+00 W/cc

Contour values:

| | | | |
|------------|------------|------------|------------|
| 4.7943E+10 | 1.9086E+11 | 7.5984E+11 | 3.0250E+12 |
| 1.2043E+13 | 4.7943E+13 | 1.9086E+14 | 7.5984E+14 |
| 3.0250E+15 | 1.2043E+16 | 4.7943E+16 | 1.9086E+17 |
| 7.5984E+17 | 3.0250E+18 | 1.2043E+19 | 4.7943E+19 |
| 1.9086E+20 | 7.5984E+20 | 3.0250E+21 | 1.2043E+22 |

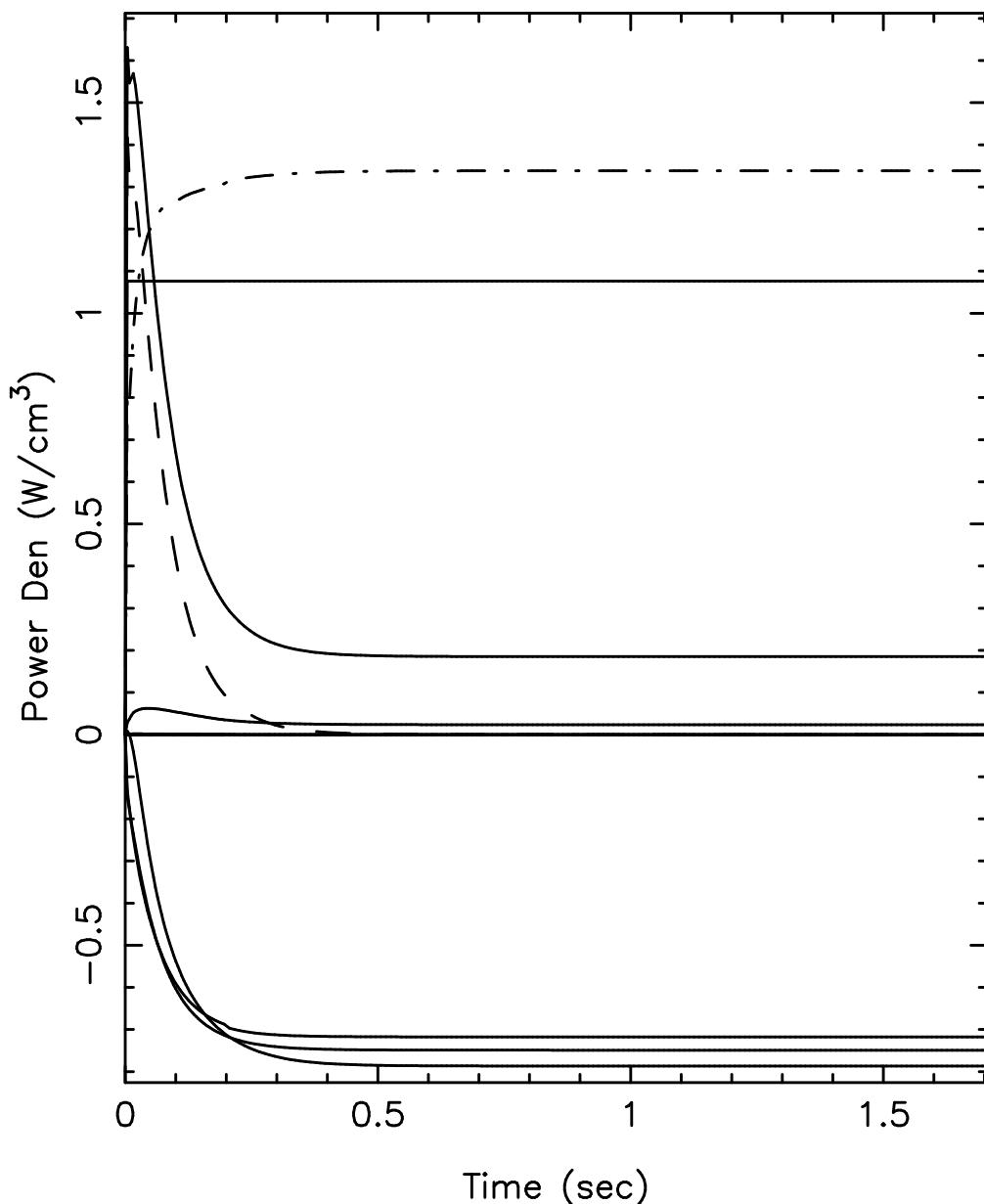
Pitch Angle Avg Source vs. u



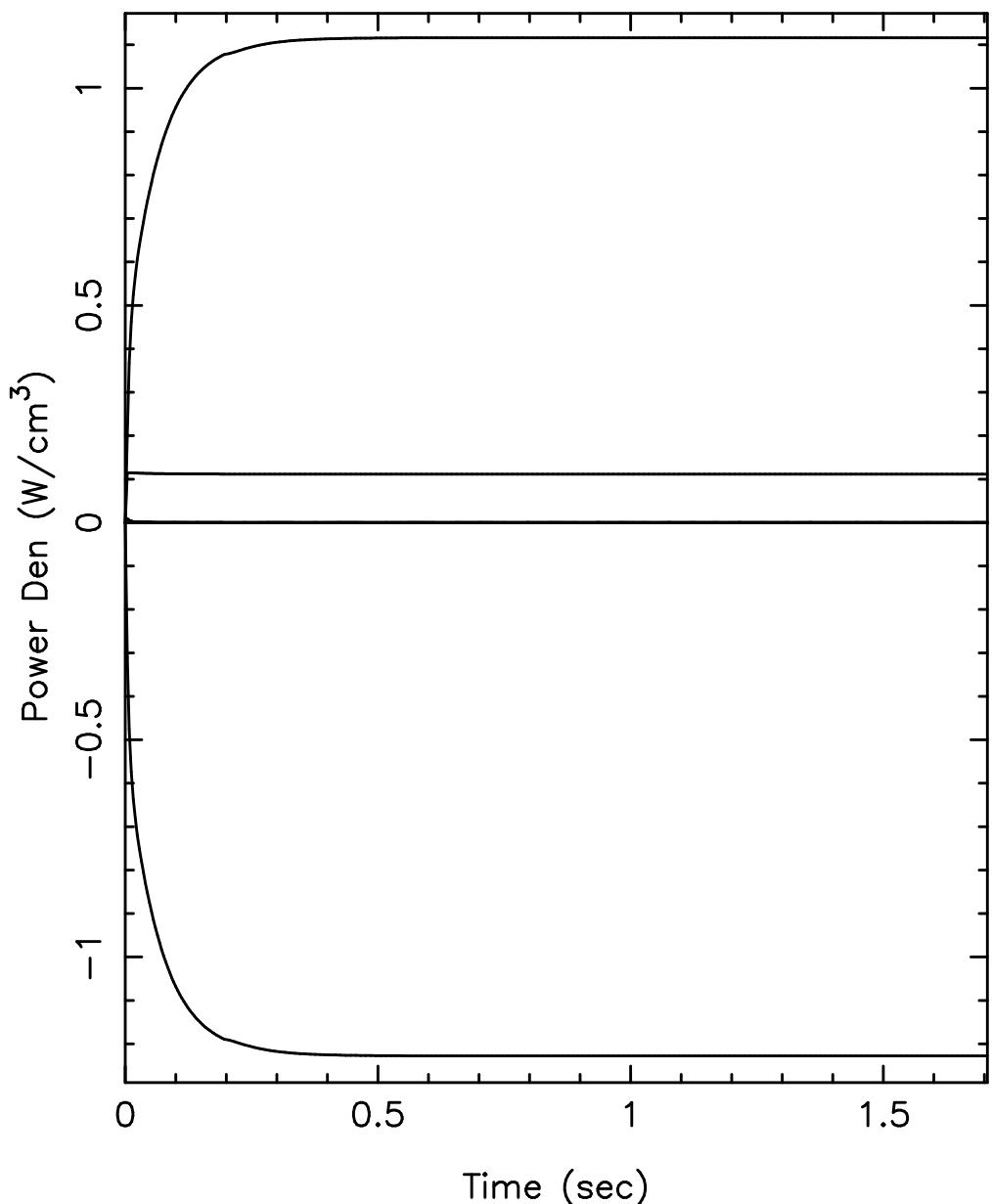
u/v_{norm}

Particle source integrated over theta0 for species 1
(normed so int(0,1)*2pi*x**2*dx=mid-plane source)
vnorm= 3.6947E+10 cm/s

time step (n) is 200 time= 1.7060E+00 secs
r/a= 3.7755E-02 radial position (R) = 1.8022E+02 cm

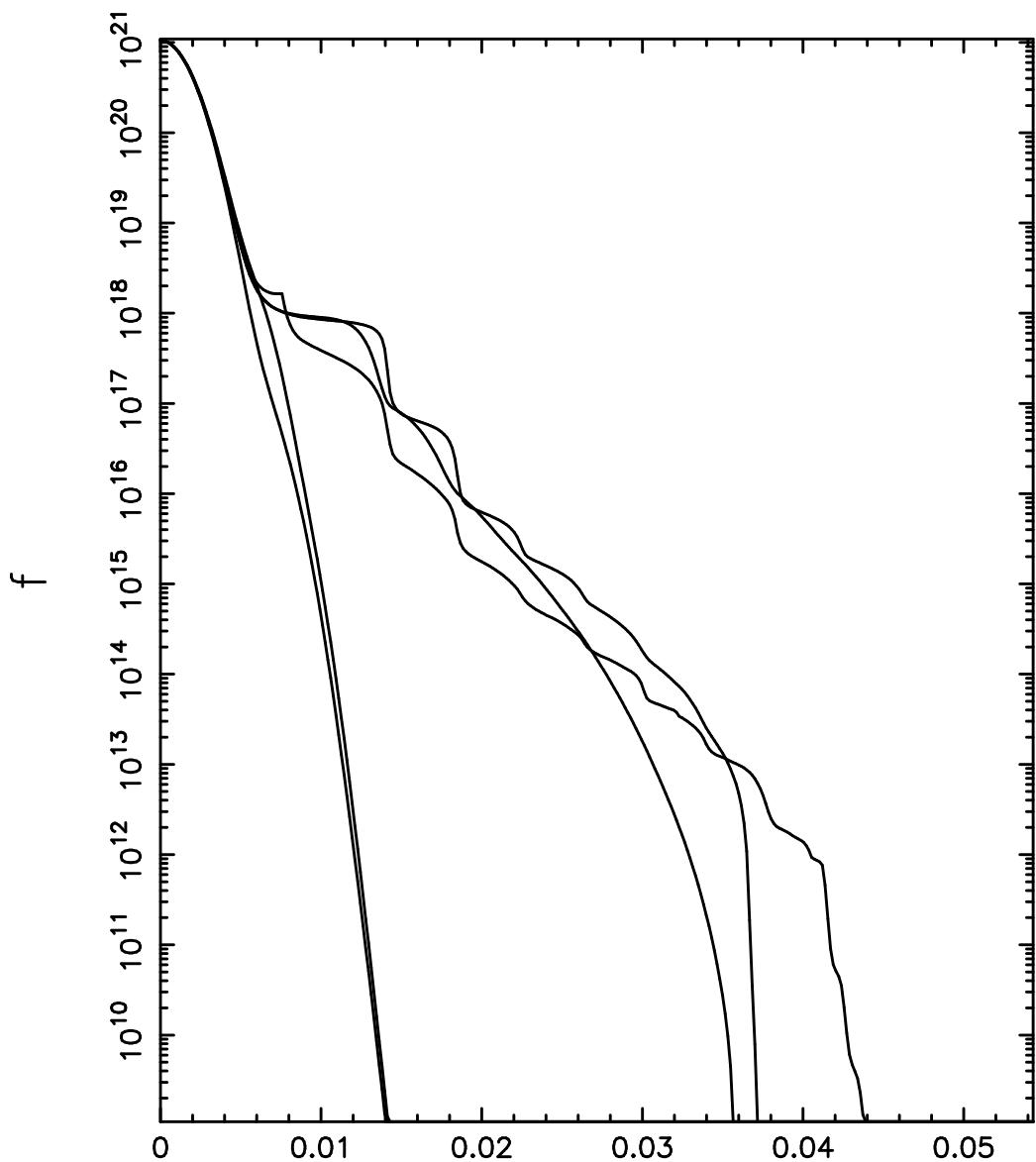


Species k= 1 Final powers in Watts/cc are:
 sum over all comp= 1.85E-01 From df/dt : 6.64E-06
 collisional transfer from Maxwellian elec.= -7.49E-01
 collisional transfer from Maxwellian ions= -7.87E-01
 collisional transfer from gens.= -7.18E-01
 ohmic drive= 0.00E+00
 RF drive= 1.34E+00
 particle sources= 1.08E+00
 loss-lossmode(k)= 2.35E-02 losses-torloss(k)= -2.01E-91
 losses due to runaway= 0.00E+00
 setting neg f to zero= 3.12E-04
 synchrotron rad losses= 0.00E+00
 phenomenological energy losses= 0.00E+00



Species k= 2 Final powers in Watts/cc are:
 sum over all comp= $-7.13E-10$ From df/dt : $-9.58E-10$
 collisional transfer from Maxwellian elec.= $-1.23E+00$
 collisional transfer from Maxwellian ions= $1.12E-01$
 collisional transfer from gens.= $1.12E+00$
 ohmic drive= $0.00E+00$
 RF drive= $6.04E-05$
 particle sources= $0.00E+00$
 loss-lossmode(k)= $0.00E+00$ losses-torloss(k)= $-6.46E-92$
 losses due to runaway= $0.00E+00$
 setting neg f to zero= $0.00E+00$
 synchrotron rad losses= $0.00E+00$
 phenomenological energy losses= $0.00E+00$

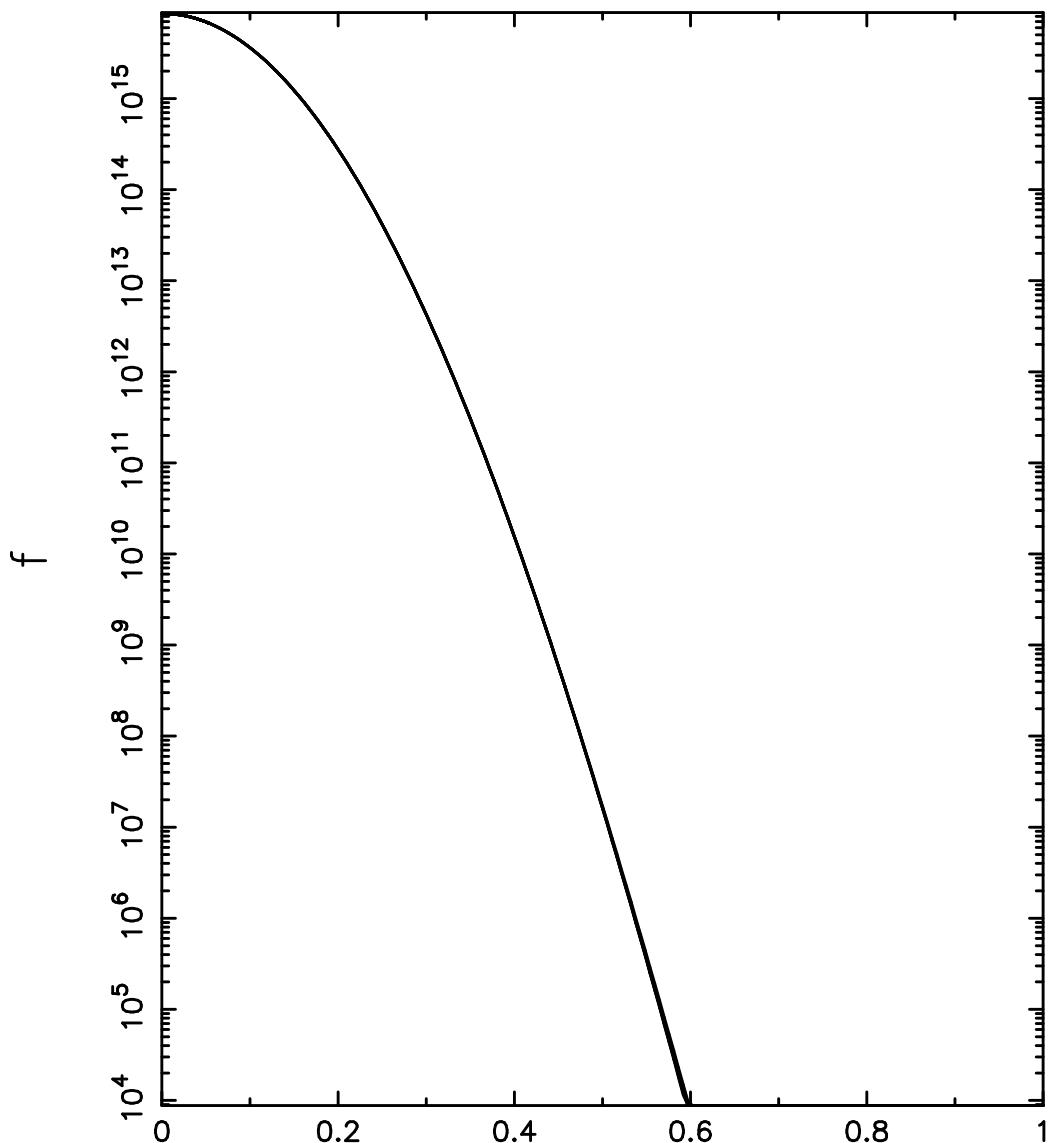
Cuts of f vs. v , at cnst pitch angle



u/v_{norm}

Distribution function vs. velocity for some angles
Species number=1, enorm= 3.00D+02
time step (n)= 200 time= 0.170600E+01 secs
r/a= 3.78E-02 radial position(R)= 1.802E+02 cm

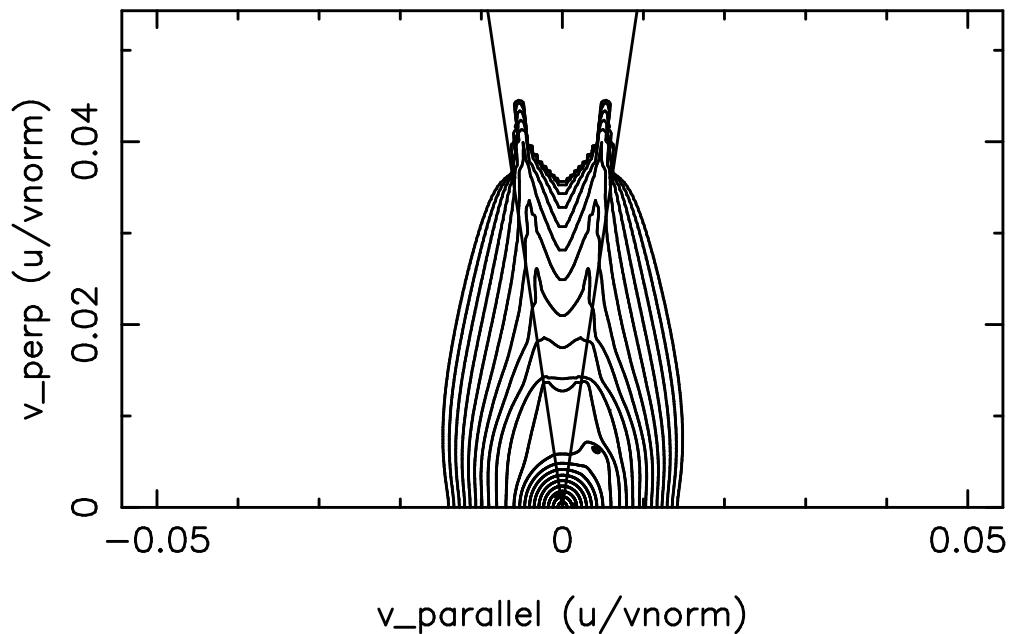
Cuts of f vs. v, at cnst pitch angle



u/v_{norm}

Distribution function vs. velocity for some angles
Species number=2, enorm= 3.00D+02
time step (n)= 200 time= 0.170600E+01 secs
r/a= 3.78E-02 radial position(R)= 1.802E+02 cm

Species 1 Distribution Function Contour Plot

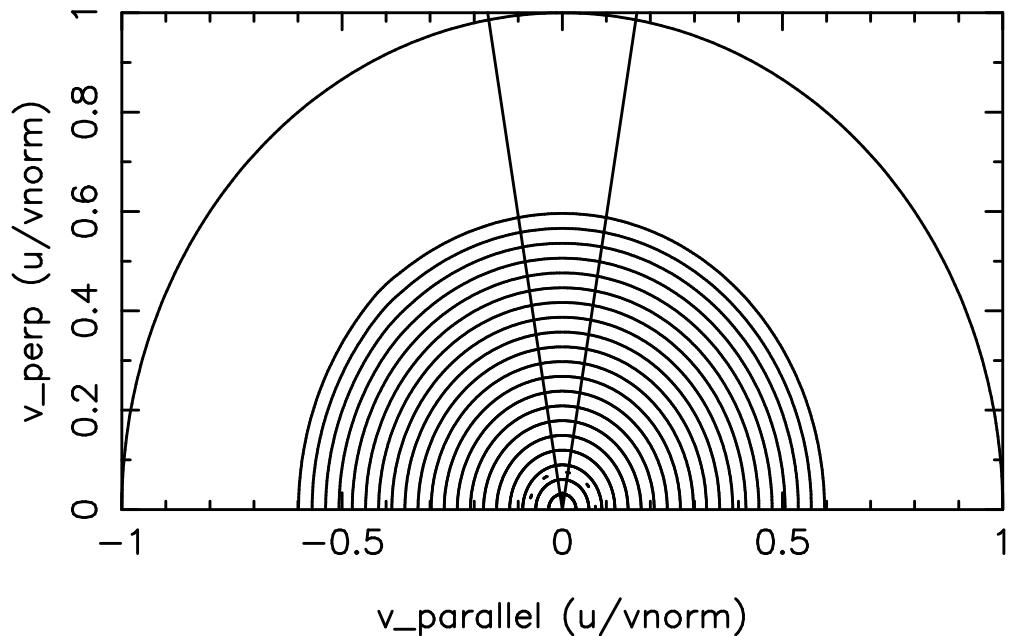


time step n= 200 time= 1.71E+00 secs
 $r/a = 3.776E-02$ radial position (R)= 1.8022E+02 cm
 $rya = 3.776E-02$ R=rpcon= 1.8022E+02 cm, Surf# 5

Contour values:

| | | | |
|--------------|--------------|--------------|--------------|
| 9.808775E+20 | 7.717534E+20 | 5.182682E+20 | 2.977001E+20 |
| 1.466991E+20 | 6.224186E+19 | 2.283468E+19 | 7.278484E+18 |
| 2.026185E+18 | 4.953425E+17 | 1.069575E+17 | 2.051841E+16 |
| 3.517794E+15 | 5.421862E+14 | 7.556106E+13 | 9.575931E+12 |
| 1.109644E+12 | 1.181962E+11 | 1.163164E+10 | 1.062652E+09 |

Species 2 Distribution Function Contour Plot



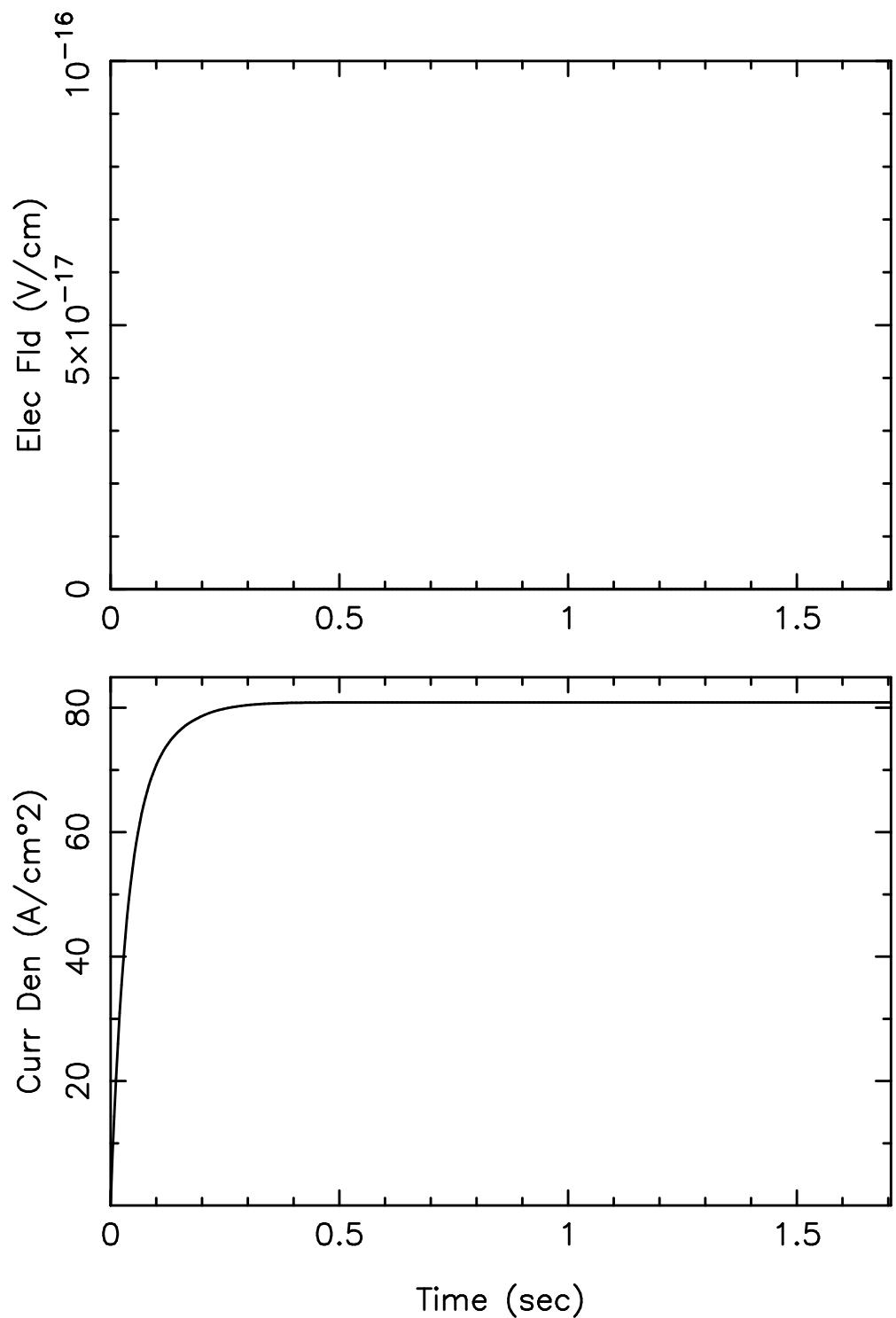
time step n= 200 time= 1.71E+00 secs
 $r/a = 3.776E-02$ radial position (R)= 1.8022E+02 cm
 $rya = 3.776E-02$ R=rpcon= 1.8022E+02 cm, Surf# 5

Contour values:

| | | | |
|--------------|--------------|--------------|--------------|
| 7.914858E+15 | 6.278110E+15 | 4.271546E+15 | 2.496733E+15 |
| 1.256309E+15 | 5.456245E+14 | 2.051670E+14 | 6.702947E+13 |
| 1.910101E+13 | 4.767598E+12 | 1.046943E+12 | 2.032053E+11 |
| 3.502674E+10 | 5.387846E+09 | 7.431762E+08 | 9.237078E+07 |
| 1.039505E+07 | 1.064179E+06 | 9.956345E+04 | 8.551182E+03 |

LOCAL RADIAL QUANTITIES

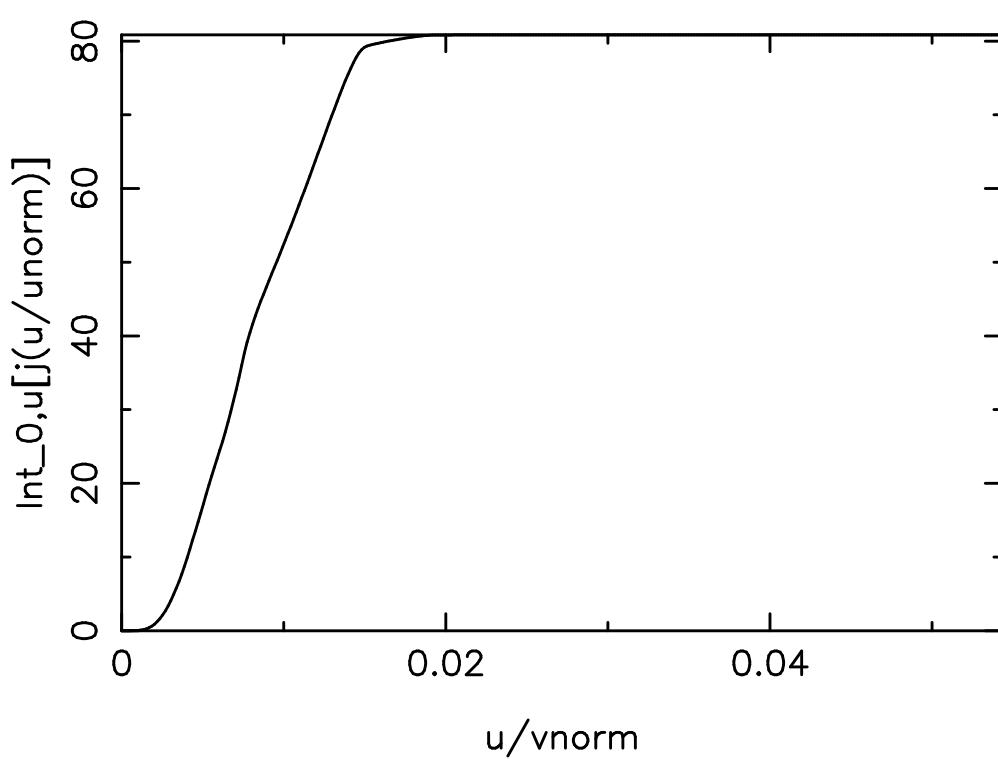
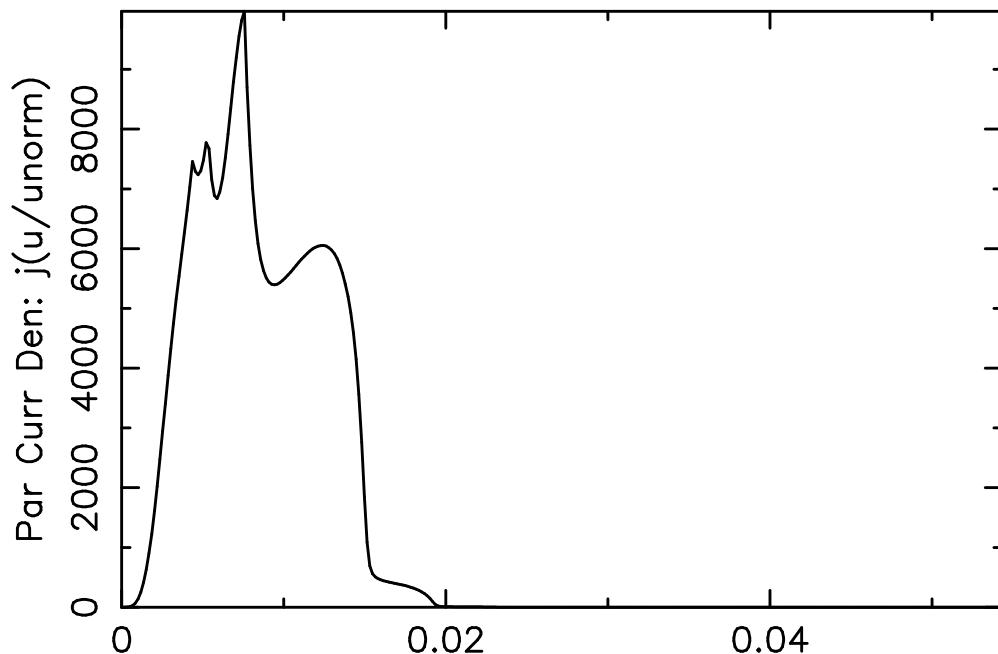
```
time step n= 200,      time= 1.7060E+00 secs
flux surf= 7      total flux surfs= 65
r/a= 5.163E-02      radial position (R)= 1.8112E+02 cms
rya= 5.163E-02      R=rpcon= 1.811E+02 cm
    enormi, enorme(=enorm) (kev) = 3250.000      300.000
vnorm/c = 1.2324136
vthe (sqrt(te/me))/c = 0.0930203
vthe/vnorm = 0.0754782
k= 1 vth(k)/vnorm = 0.0014386
k= 2 vth(k)/vnorm = 0.0754782
k= 3 vth(k)/vnorm = 0.0014386
k= 4 vth(k)/vnorm = 0.0001437
k= 5 vth(k)/vnorm = 0.0754782
```



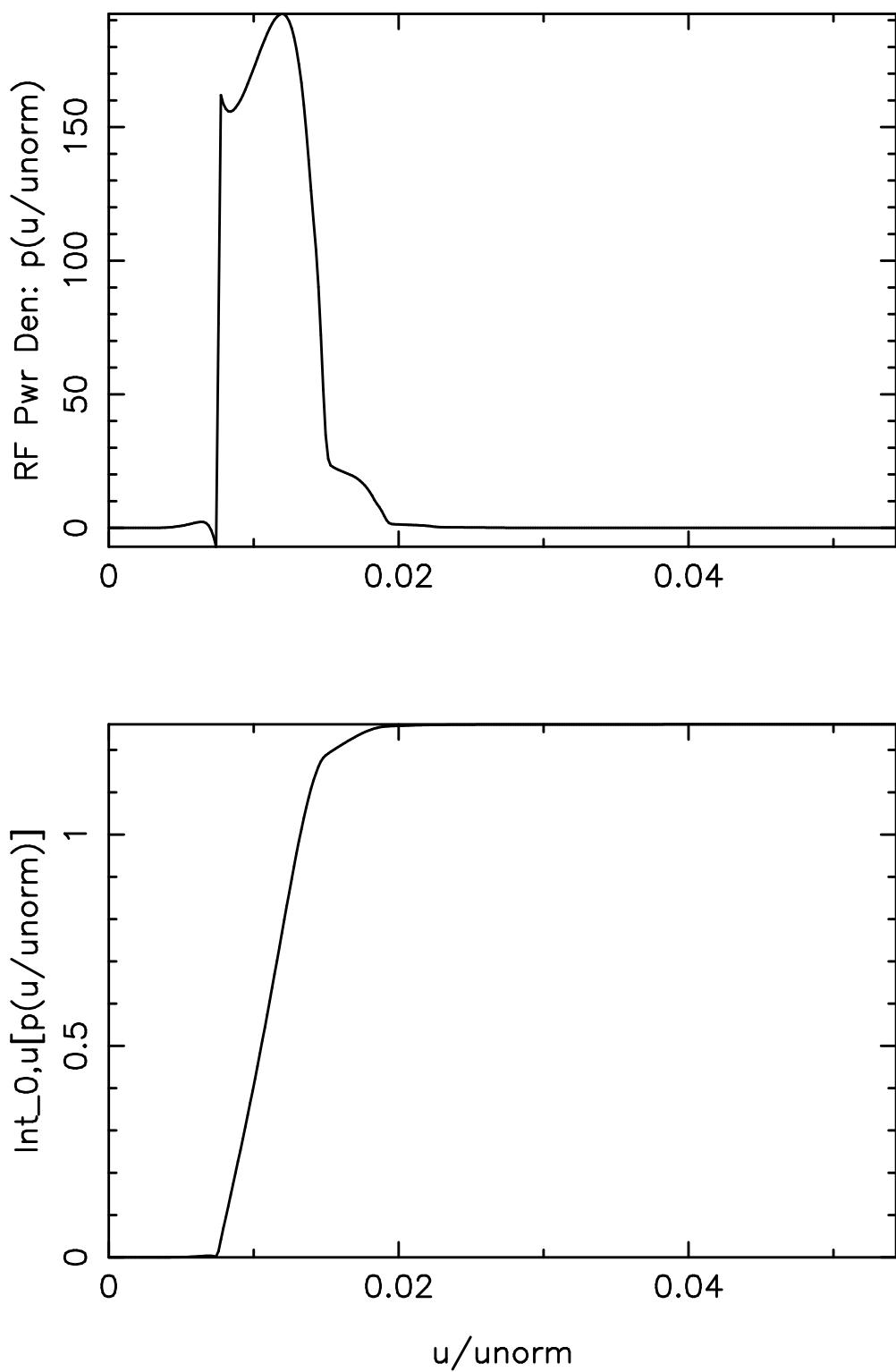
Electric field = 0.0000E+00 (V/cm)

FSA current den of species 1 = 8.0851E+01 Amps/cm**2

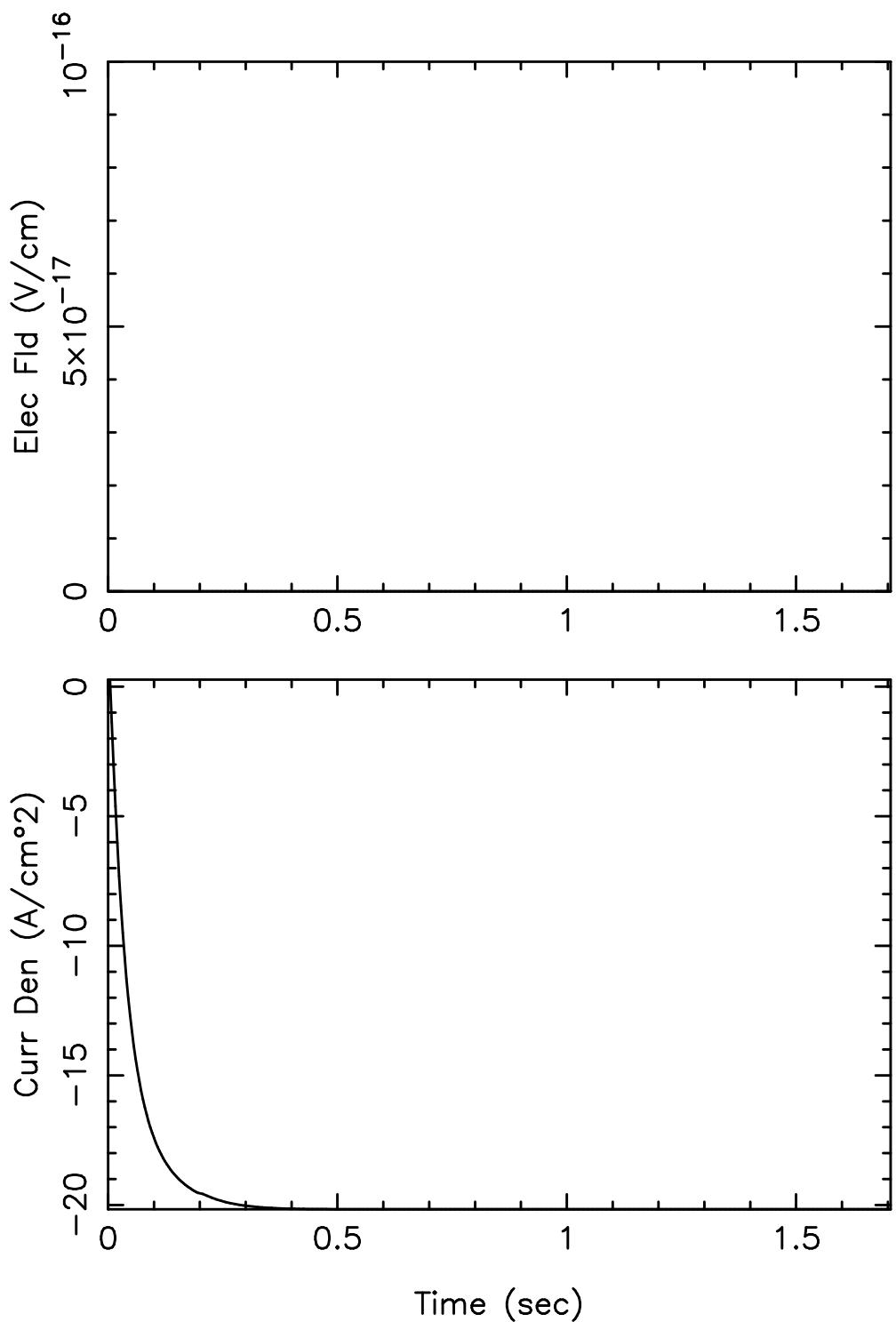
Current drive efficiency $j/(2\pi R \cdot prf)$ = 5.7492E-02 A/W



Species: 1 Current = $0.8085E+02$ Amps/cm²

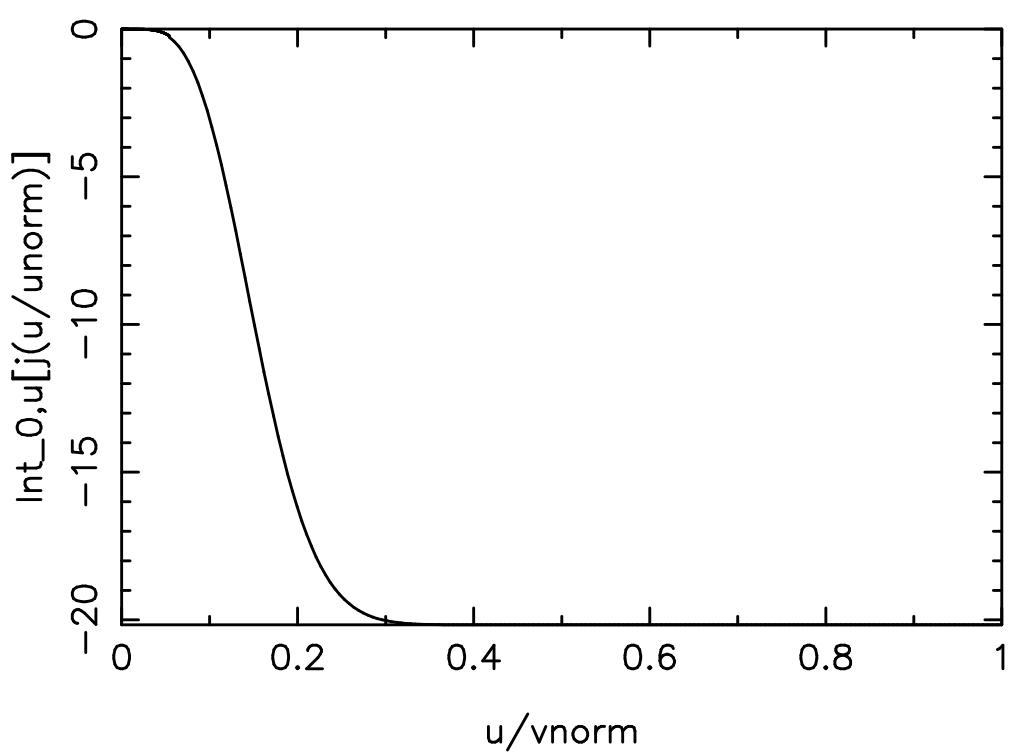
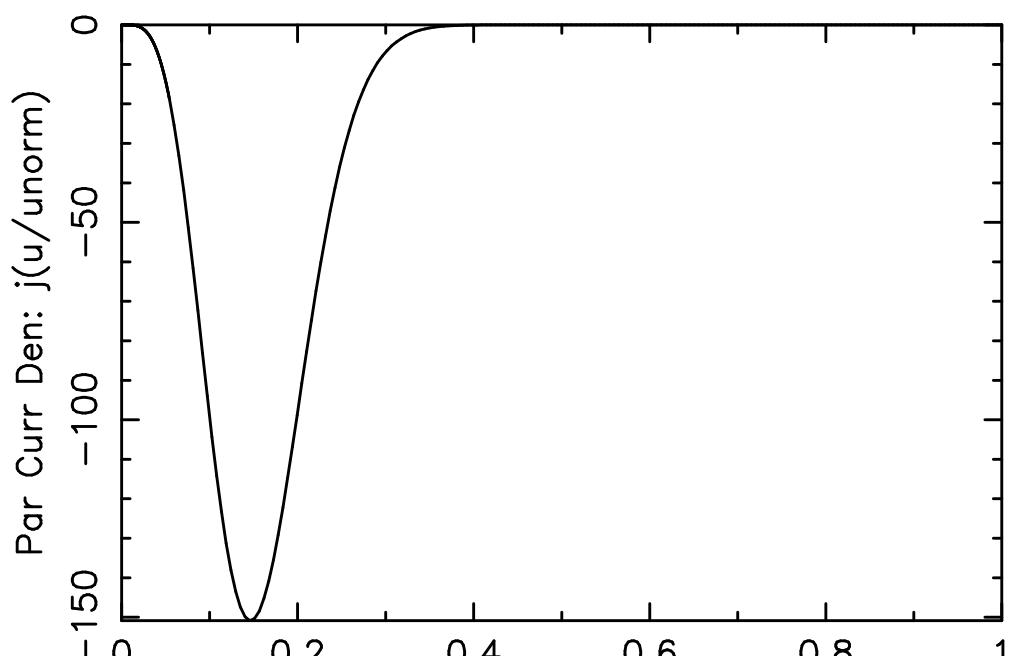


Species: 1 Power =0.1261E+01 Watts/cc

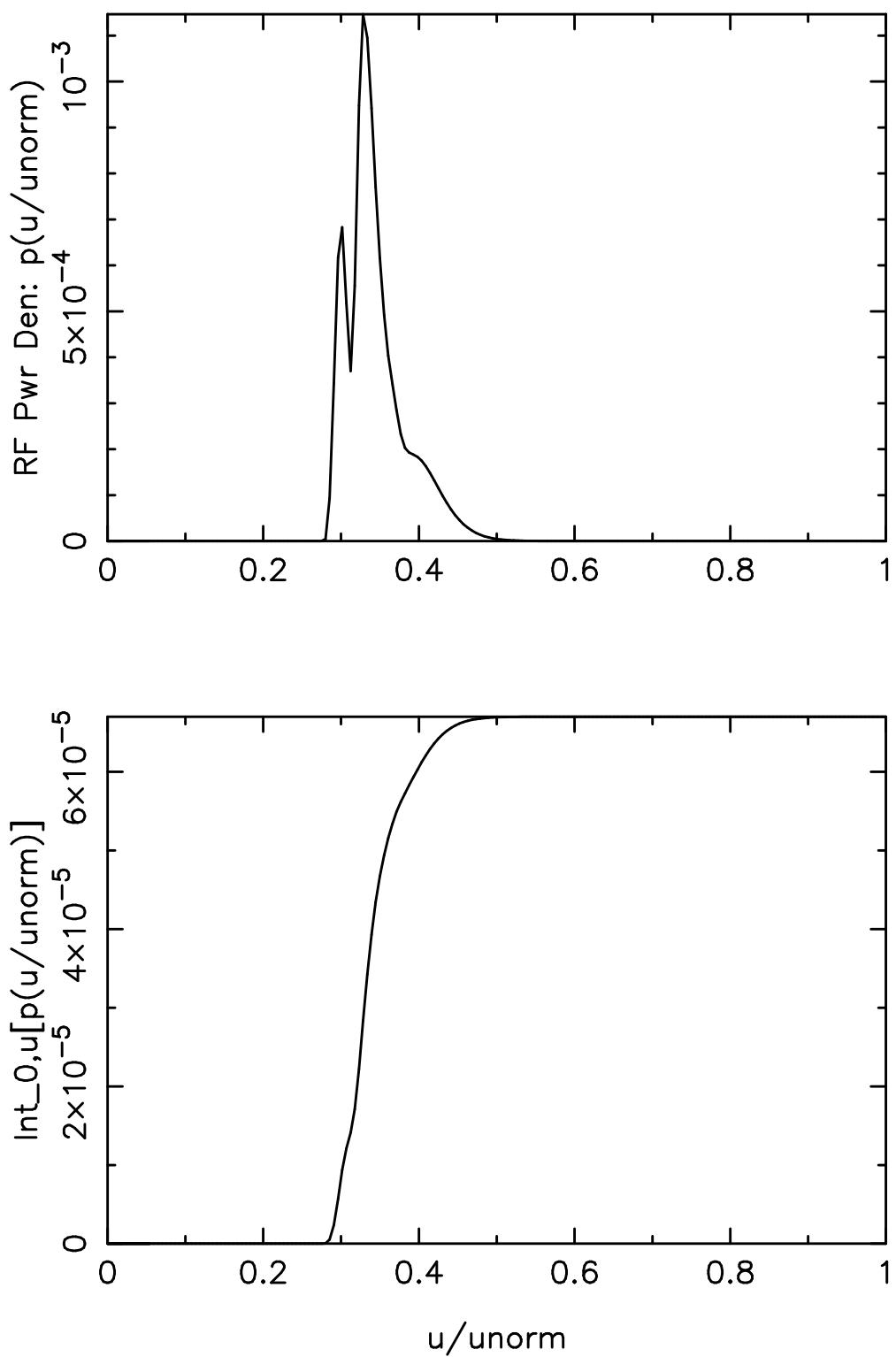


Electric field = 0.0000E+00 (V/cm)
 FSA current den of species 2 = -2.0167E+01 Amps/cm**2

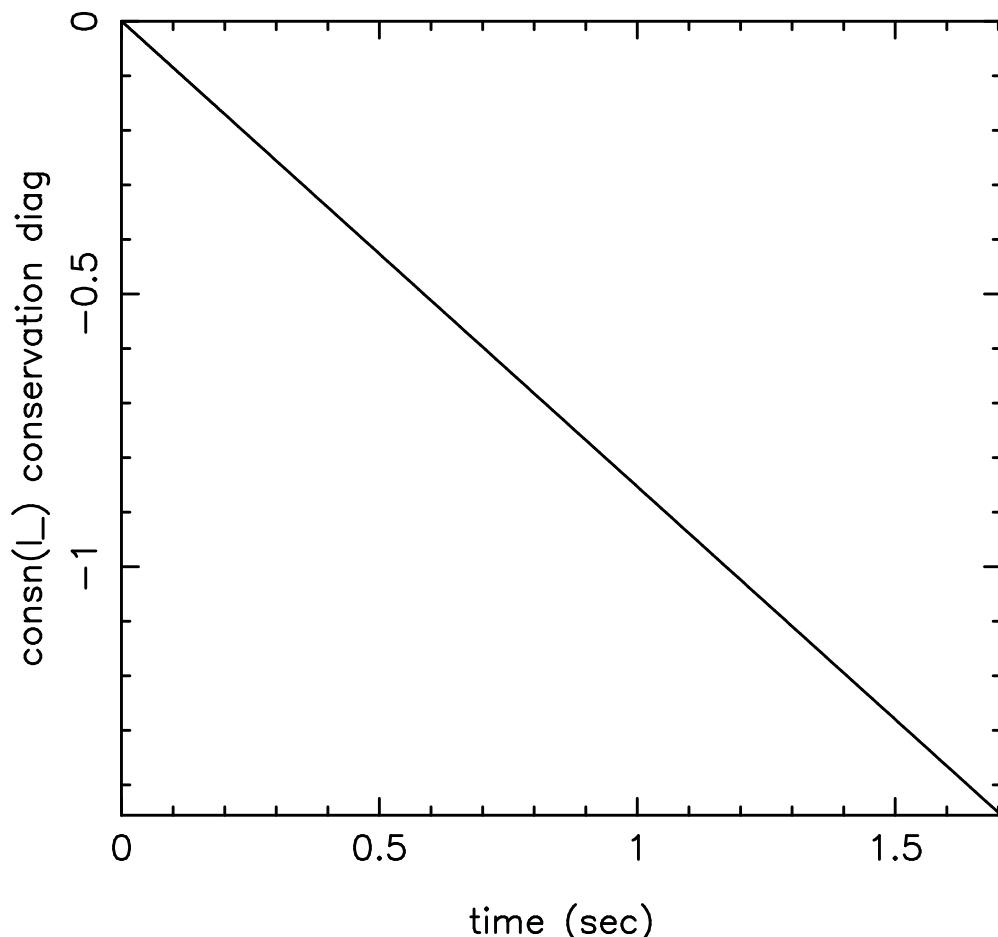
Current drive efficiency $j/(2\pi R \cdot prf)$ = -2.6976E+02 A/W
 Electron current (units $ne \cdot q \cdot v_{th}(kelec, lr_*)$) = -7.5559E-04
 power (units: $ne \cdot v_{th}(kelec, lr_*)^2 \cdot me \cdot nu_0$) = 2.0944E-08
 efficiency (j/p) (Fisch 1978 units) = -3.6077E+04
 efficiency (j/p) ($e/(m \cdot c \cdot nu_c$ units) = -3.1217E+02
 $v_{th}(kelec, lr_*) = \sqrt{T/m} = 2.7887E+09$ cm/sec
 $nu_0 = 7.5541E+04$ Hz



Species: 2 Current =-.2017E+02 Amps/cm²



Species: 2 Power =0.6701E-04 Watts/cc

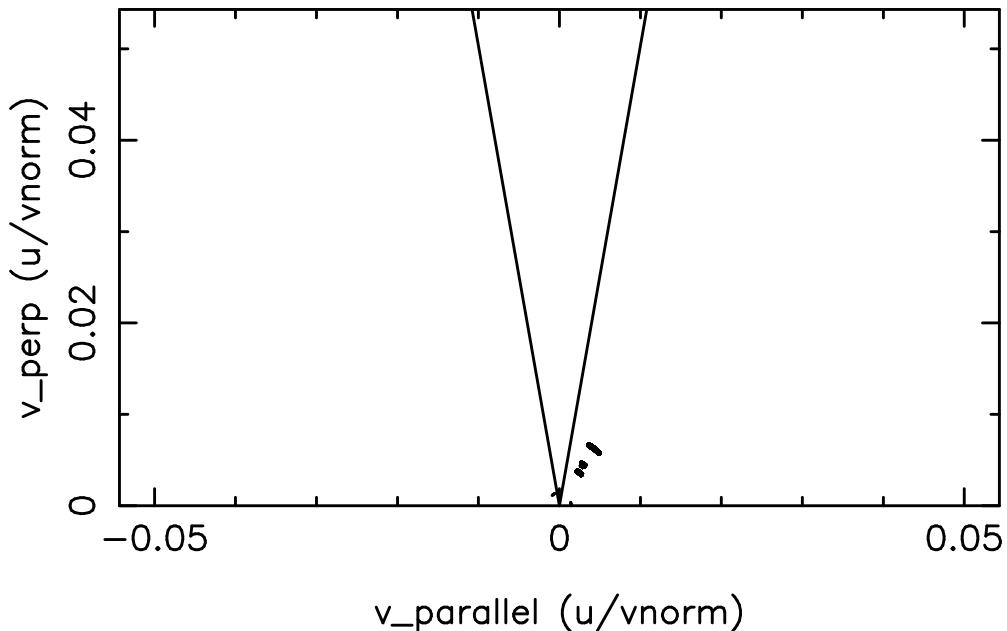


consn(l_-)= -1.4558E+00

Perfect conservation should yield machine accuracy,
or about 1.e-14:

time step (n) is 200 time= 1.7060E+00 secs
r/a= 5.1633E-02 radial position (R) = 1.8112E+02 cm

Species 1 Source Function (units: dist. f/sec)



time step n= 200 time= 1.71E+00 secs
 $r/a = 5.163E-02$ radial position (R)= 1.8112E+02 cm
 $rya = 5.163E-02$ R=rpcon= 1.8112E+02 cm, Surf# 7

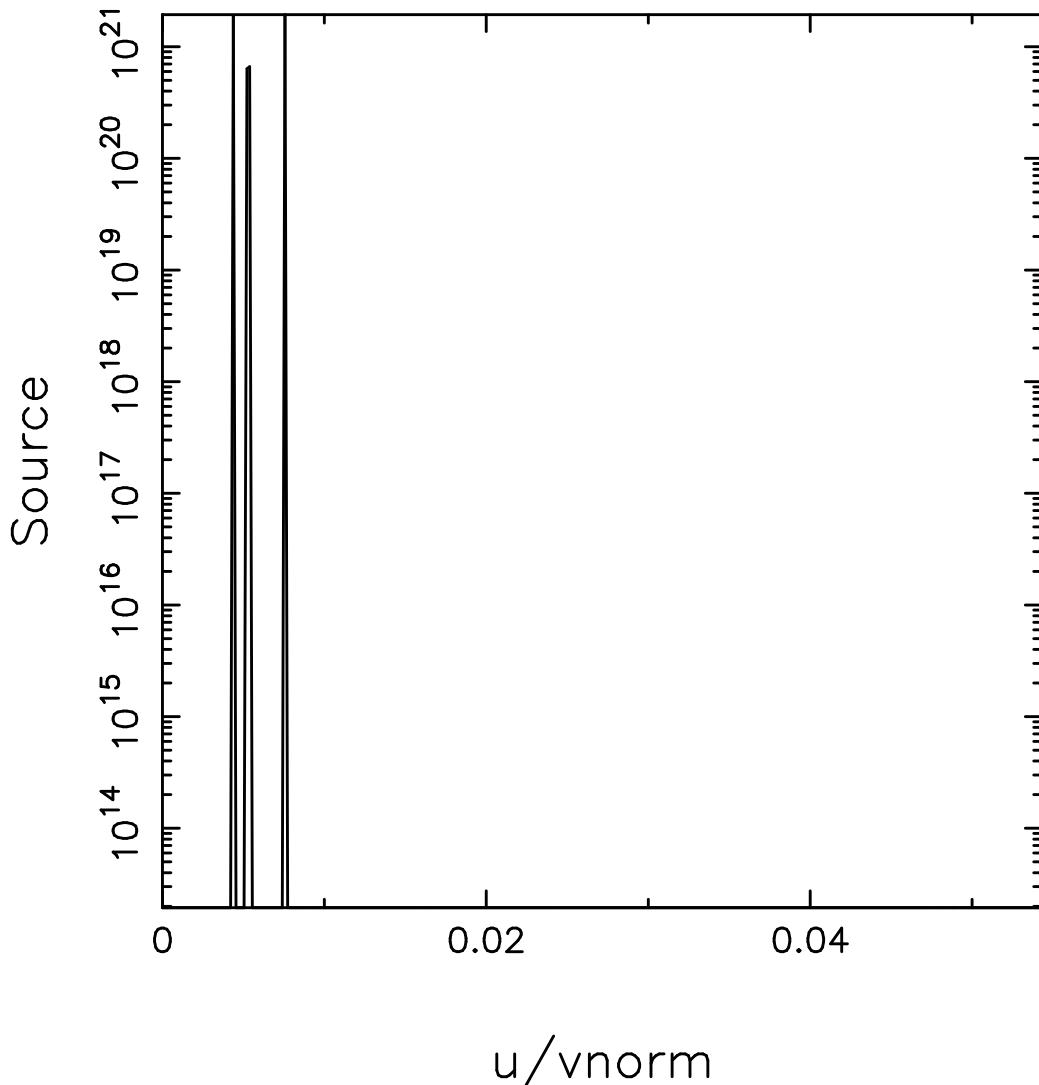
Particle source rate= 1.0203E+14 ptcls/cc/sec

Total source power [entr(..5..)]= 1.0235E+00 W/cc

Contour values:

| | | | |
|------------|------------|------------|------------|
| 3.6831E+10 | 1.4663E+11 | 5.8374E+11 | 2.3239E+12 |
| 9.2517E+12 | 3.6831E+13 | 1.4663E+14 | 5.8374E+14 |
| 2.3239E+15 | 9.2517E+15 | 3.6831E+16 | 1.4663E+17 |
| 5.8374E+17 | 2.3239E+18 | 9.2517E+18 | 3.6831E+19 |
| 1.4663E+20 | 5.8374E+20 | 2.3239E+21 | 9.2517E+21 |

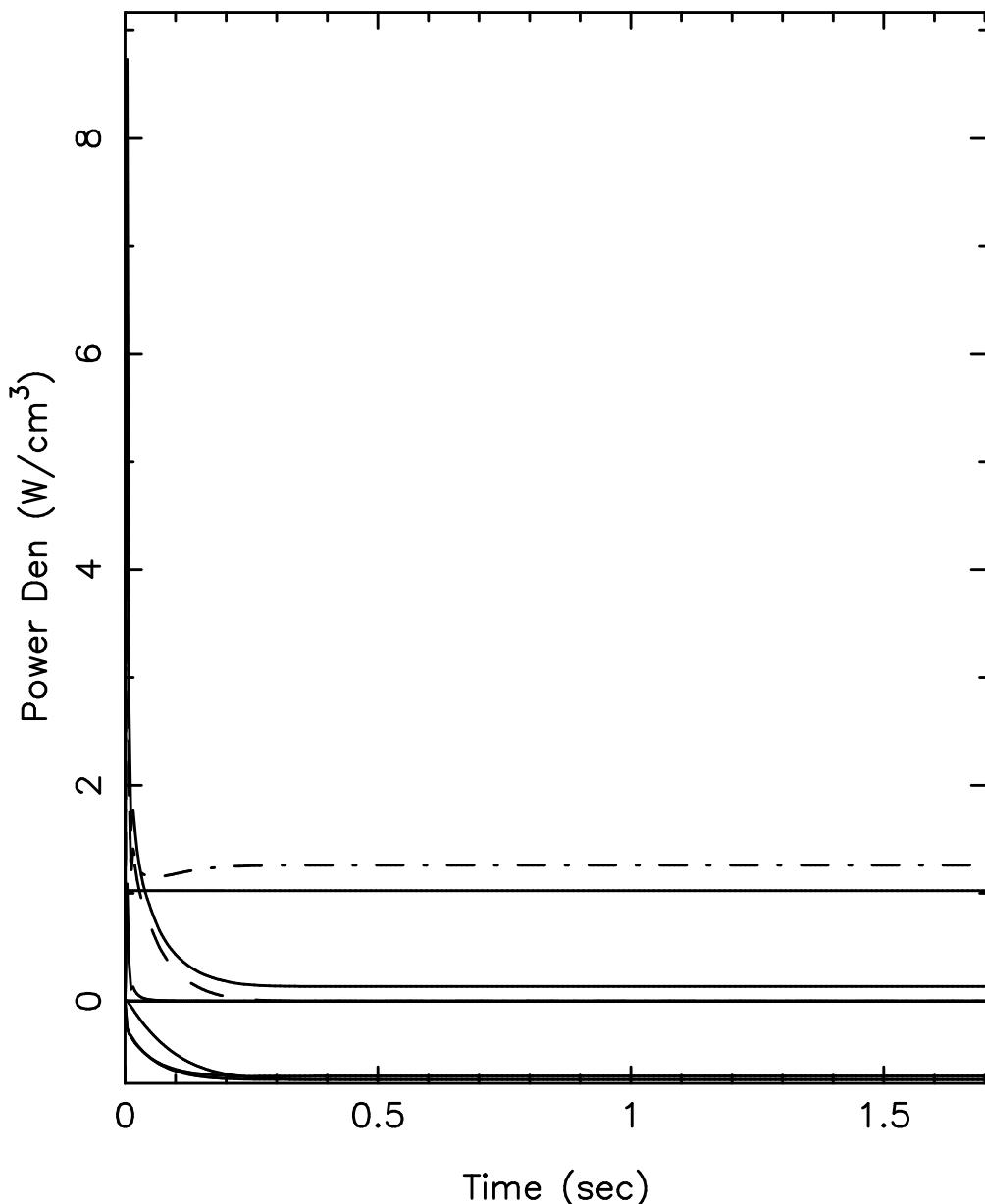
Pitch Angle Avg Source vs. u



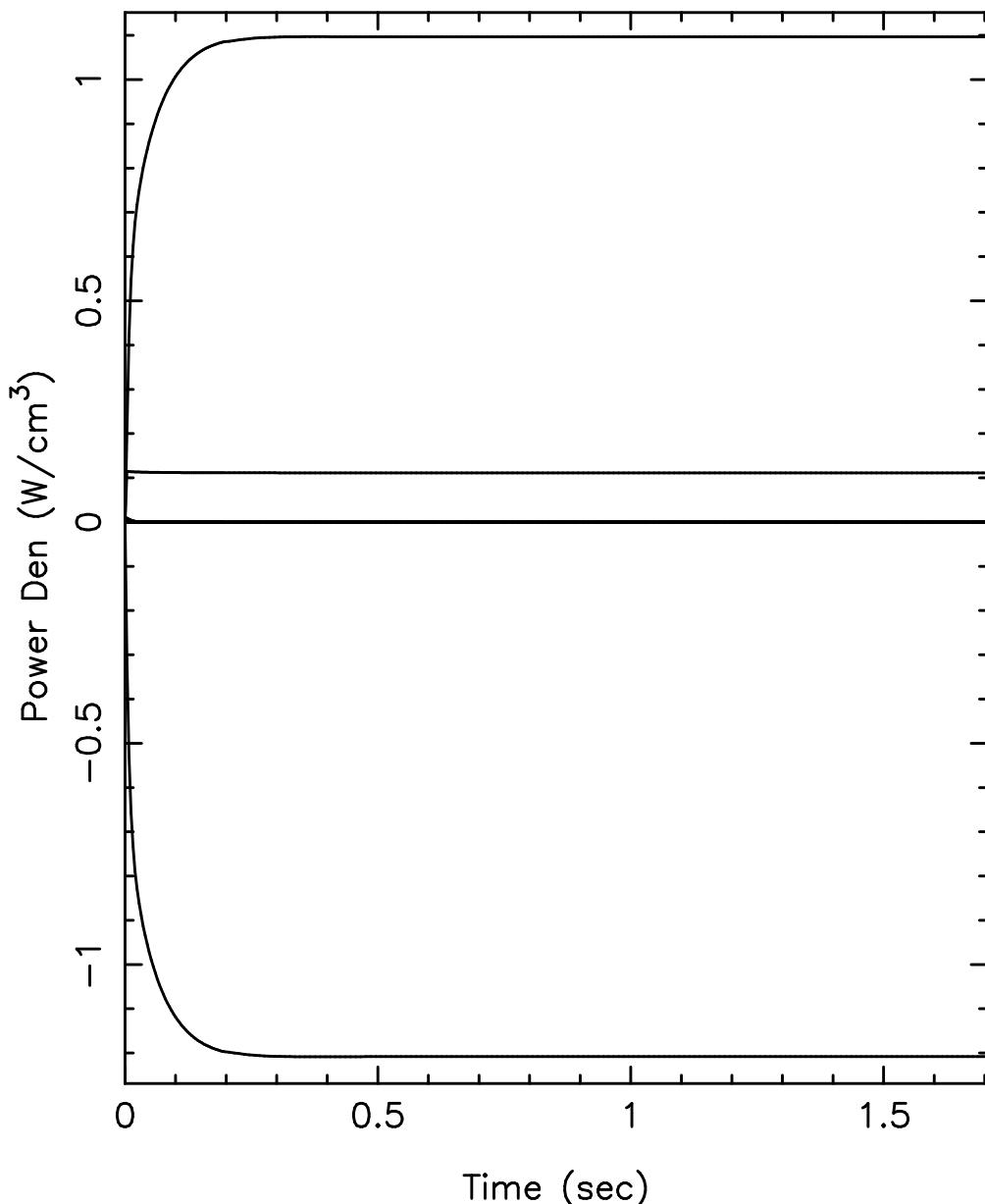
$u/vnorm$

Particle source integrated over theta0 for species 1
(normed so int(0,1)*2pi*x**2*dx=mid-plane source)
vnorm= 3.6947E+10 cm/s

time step (n) is 200 time= 1.7060E+00 secs
r/a= 5.1633E-02 radial position (R) = 1.8112E+02 cm

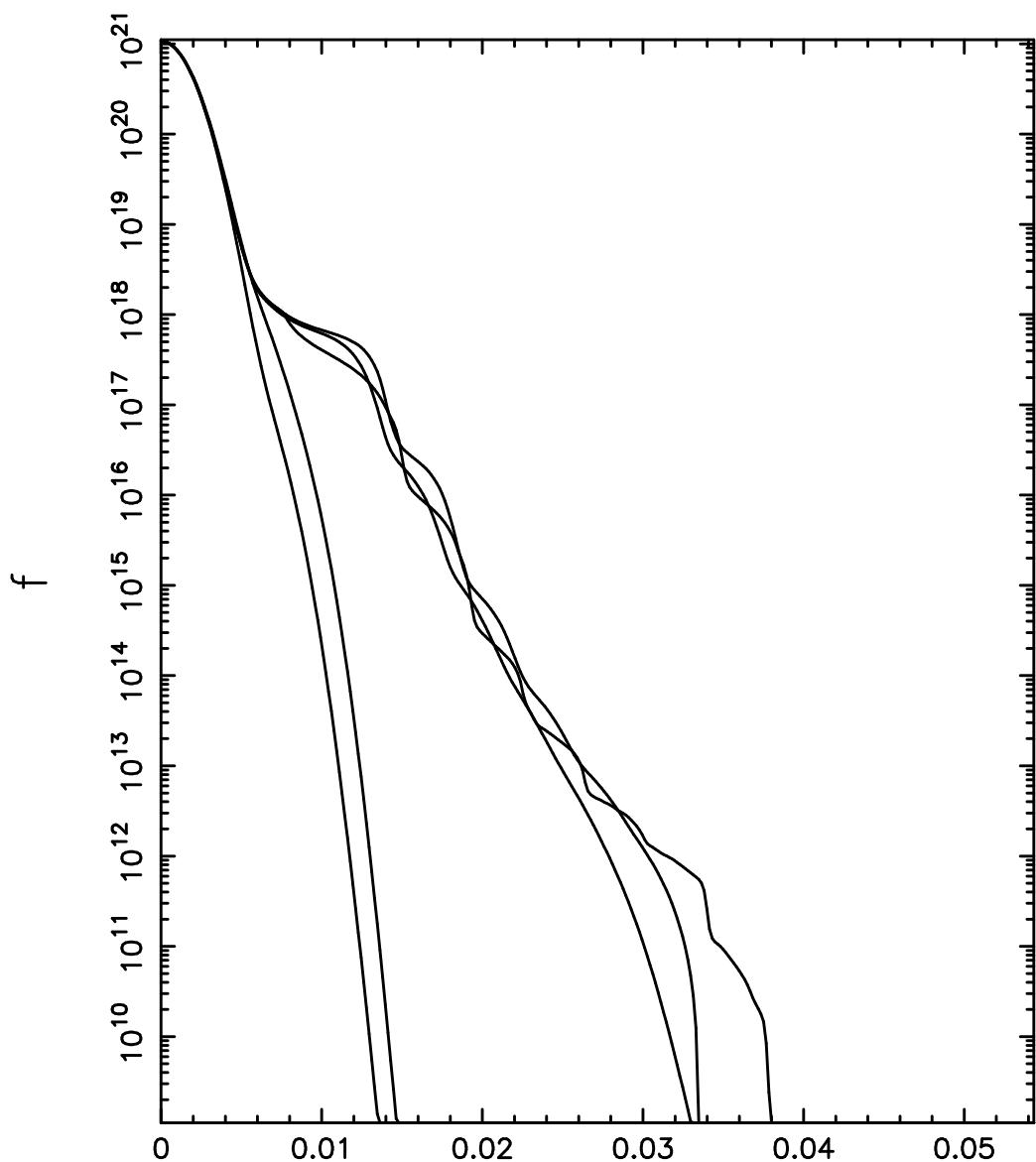


Species k= 1 Final powers in Watts/cc are:
sum over all comp= 1.36E-01 From df/dt : 1.16E-05
collisional transfer from Maxwellian elec.= -7.26E-01
collisional transfer from Maxwellian ions= -7.27E-01
collisional transfer from gens.= -6.95E-01
ohmic drive= 0.00E+00
RF drive= 1.26E+00
particle sources= 1.02E+00
loss-lossmode(k)= 1.88E-05 losses-torloss(k)= -1.96E-91
losses due to runaway= 0.00E+00
setting neg f to zero= 9.72E-16
synchrotron rad losses= 0.00E+00
phenomenological energy losses= 0.00E+00



Species k= 2 Final powers in Watts/cc are:
sum over all comp= -1.75E-09 From df/dt : -1.65E-09
collisional transfer from Maxwellian elec.= -1.21E+00
collisional transfer from Maxwellian ions= 1.11E-01
collisional transfer from gens.= 1.10E+00
ohmic drive= 0.00E+00
RF drive= 6.70E-05
particle sources= 0.00E+00
loss-lossmode(k)= 0.00E+00 losses-torloss(k)= -6.44E-92
losses due to runaway= 0.00E+00
setting neg f to zero= 0.00E+00
synchrotron rad losses= 0.00E+00
phenomenological energy losses= 0.00E+00

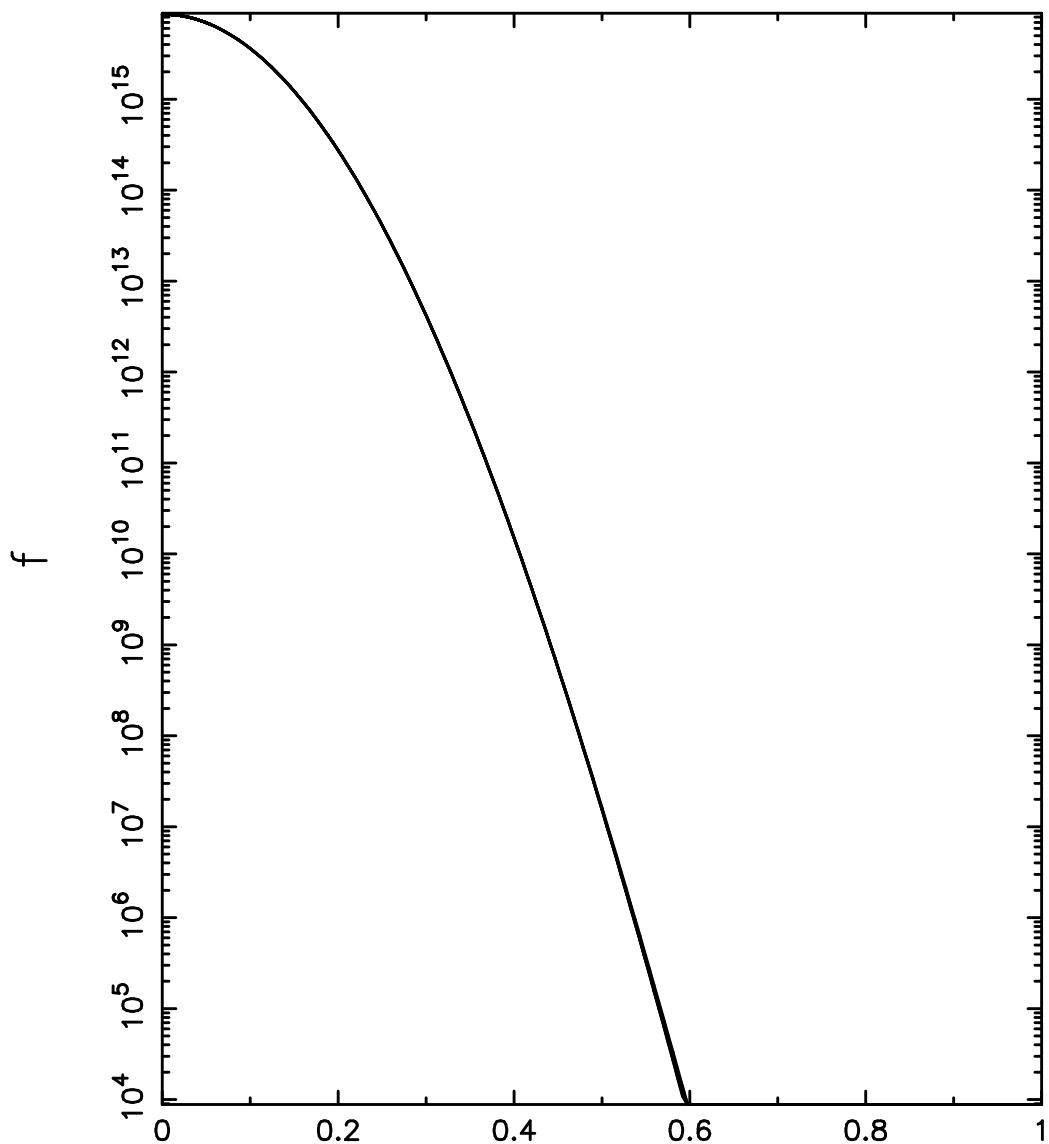
Cuts of f vs. v , at cnst pitch angle



u/v_{norm}

Distribution function vs. velocity for some angles
Species number=1, enorm= 3.00D+02
time step (n)= 200 time= 0.170600E+01 secs
r/a= 5.16E-02 radial position(R)= 1.811E+02 cm

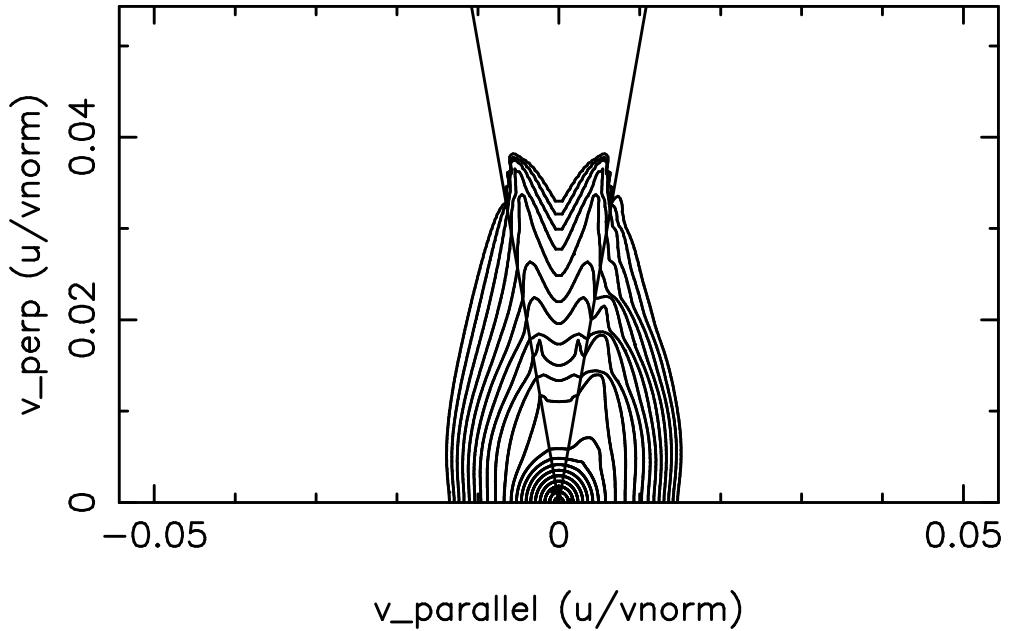
Cuts of f vs. v, at cnst pitch angle



u/v_{norm}

Distribution function vs. velocity for some angles
Species number=2, enorm= 3.00D+02
time step (n)= 200 time= 0.170600E+01 secs
r/a= 5.16E-02 radial position(R)= 1.811E+02 cm

Species 1 Distribution Function Contour Plot

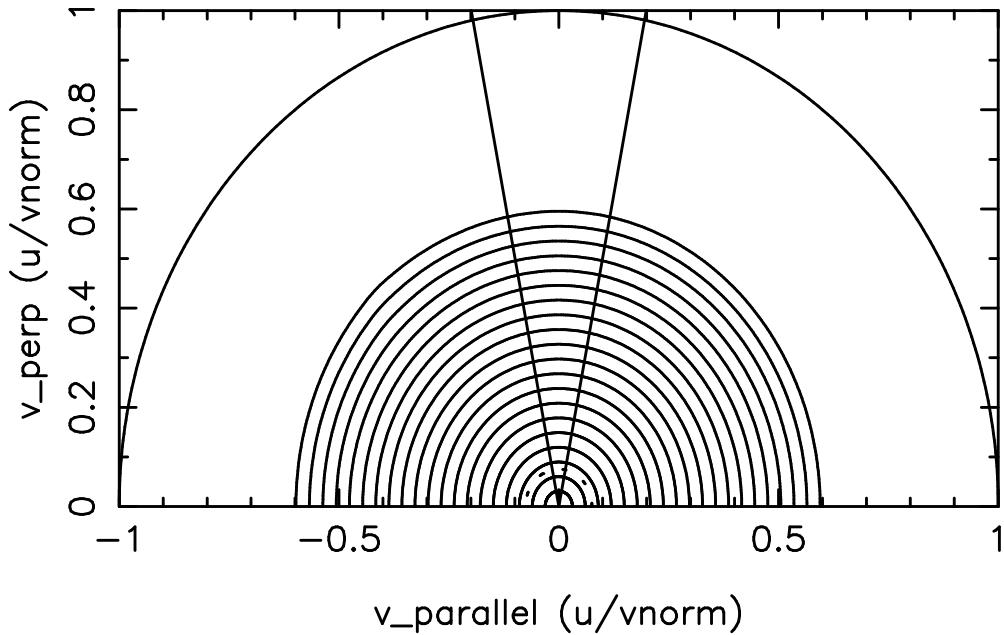


time step n= 200 time= 1.71E+00 secs
 $r/a = 5.163E-02$ radial position (R)= 1.8112E+02 cm
 $rya = 5.163E-02$ R=rpcon= 1.8112E+02 cm, Surf# 7

Contour values:

| | | | |
|--------------|--------------|--------------|--------------|
| 9.946789E+20 | 7.826686E+20 | 5.256590E+20 | 3.019919E+20 |
| 1.488413E+20 | 6.316366E+19 | 2.317782E+19 | 7.389433E+18 |
| 2.057482E+18 | 5.030819E+17 | 1.086439E+17 | 2.084388E+16 |
| 3.573734E+15 | 5.507945E+14 | 7.675343E+13 | 9.725369E+12 |
| 1.126675E+12 | 1.199697E+11 | 1.180112E+10 | 1.077578E+09 |

Species 2 Distribution Function Contour Plot



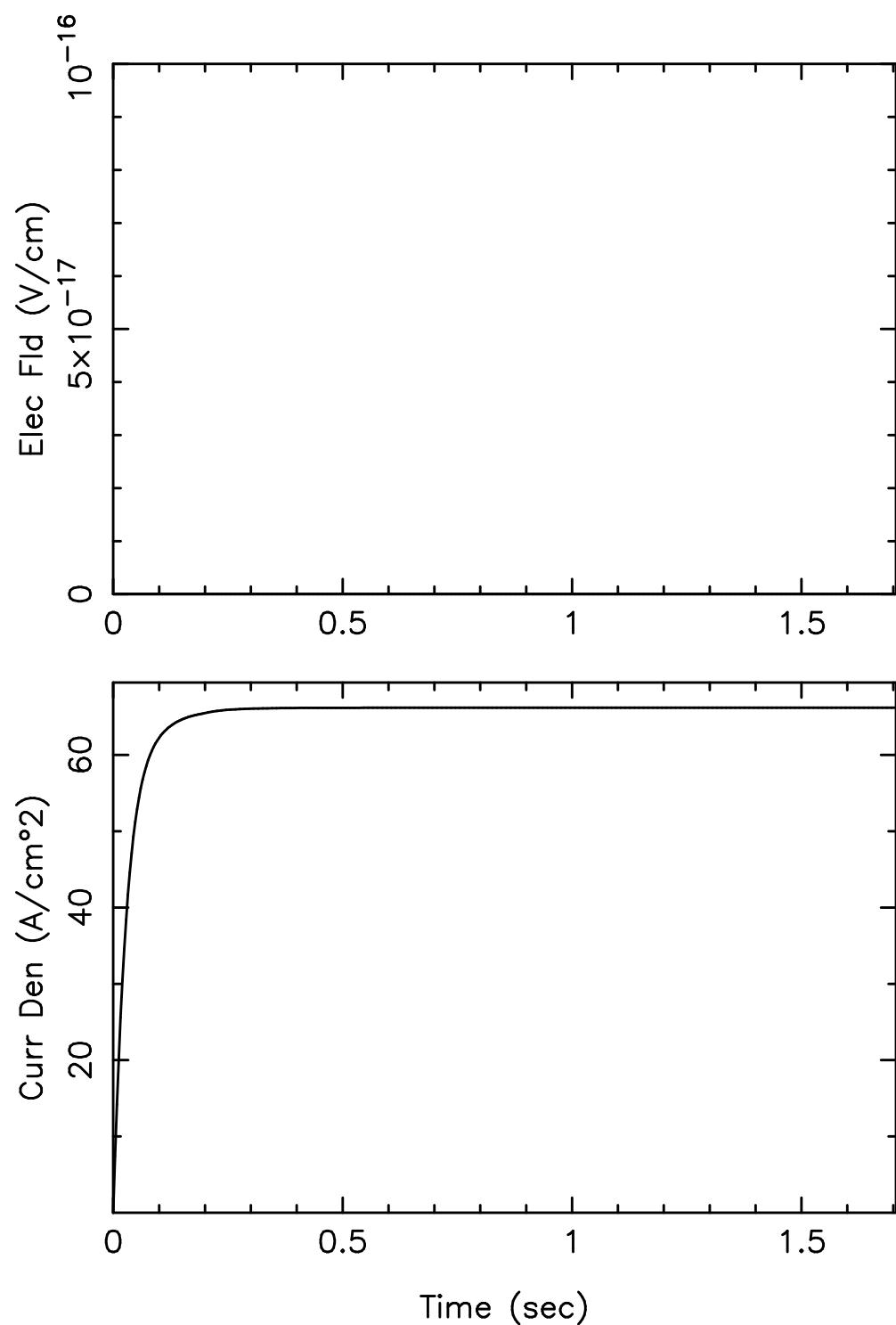
time step n= 200 time= 1.71E+00 secs
 $r/a = 5.163E-02$ radial position (R)= 1.8112E+02 cm
 $rya = 5.163E-02$ $R=rpcon= 1.8112E+02$ cm, Surf# 7

Contour values:

| | | | |
|--------------|--------------|--------------|--------------|
| 7.930346E+15 | 6.290735E+15 | 4.280510E+15 | 2.502264E+15 |
| 1.259269E+15 | 5.469963E+14 | 2.057173E+14 | 6.722059E+13 |
| 1.915856E+13 | 4.782658E+12 | 1.050376E+12 | 2.038890E+11 |
| 3.514610E+10 | 5.406164E+09 | 7.456544E+08 | 9.266680E+07 |
| 1.042628E+07 | 1.067084E+06 | 9.979994E+04 | 8.567758E+03 |

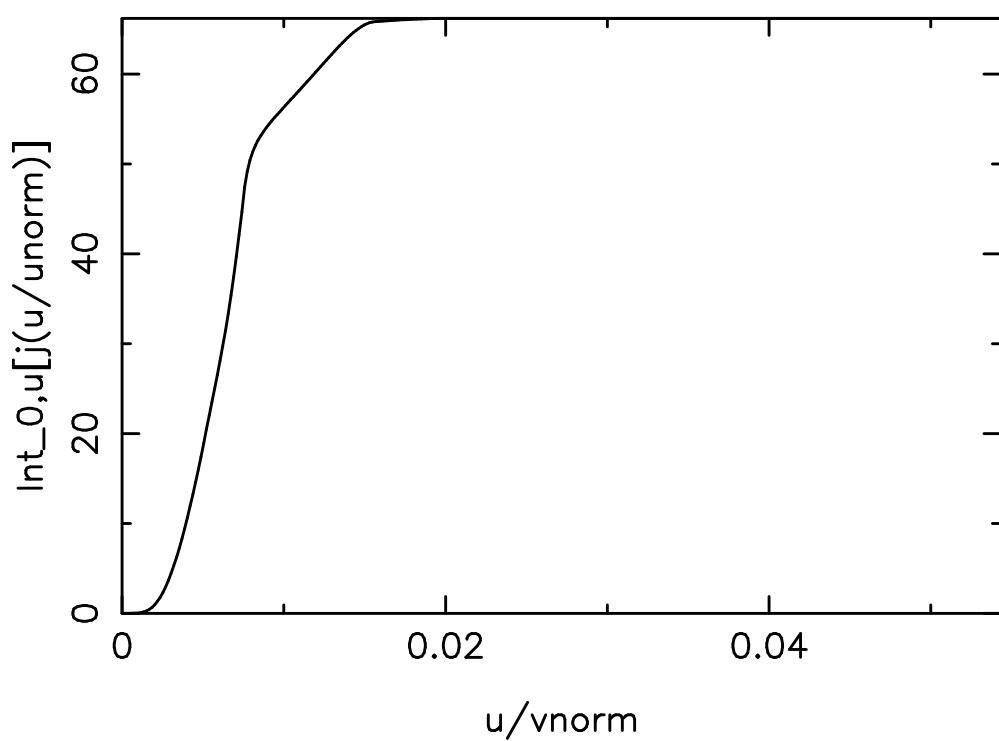
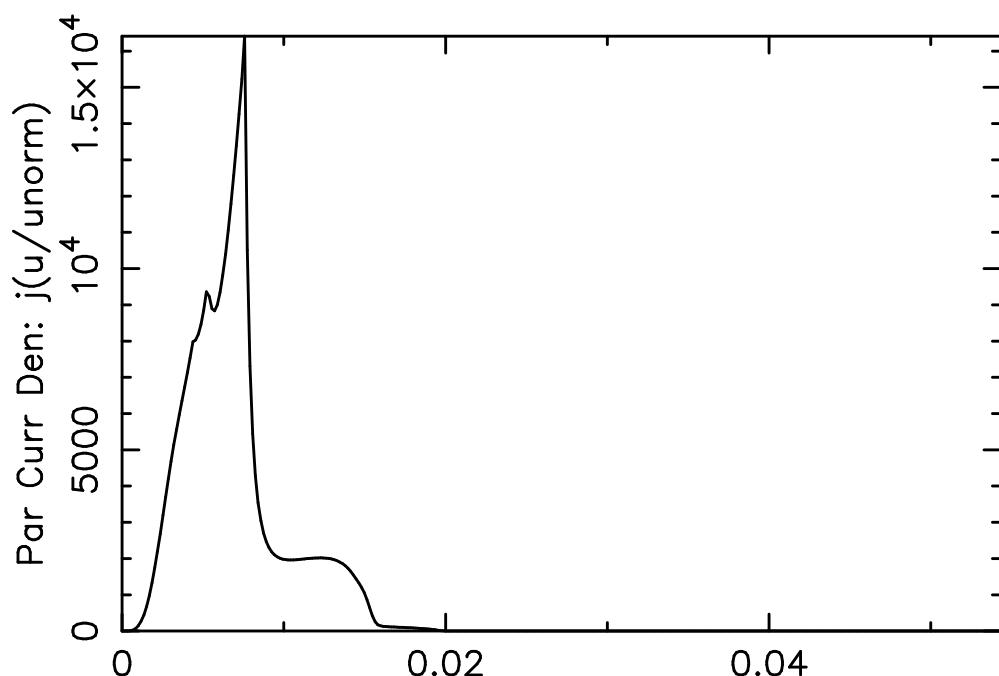
LOCAL RADIAL QUANTITIES

```
time step n= 200,      time= 1.7060E+00 secs
flux surf= 8      total flux surfs= 65
r/a= 5.857E-02      radial position (R)= 1.8156E+02 cms
rya= 5.857E-02      R=rpcon= 1.816E+02 cm
    enormi, enorme(=enorm) (kev) = 3250.000      300.000
vnorm/c = 1.2324136
vthe (sqrt(te/me))/c = 0.0929568
vthe/vnorm = 0.0754266
k= 1 vth(k)/vnorm = 0.0014376
k= 2 vth(k)/vnorm = 0.0754266
k= 3 vth(k)/vnorm = 0.0014376
k= 4 vth(k)/vnorm = 0.0001436
k= 5 vth(k)/vnorm = 0.0754266
```

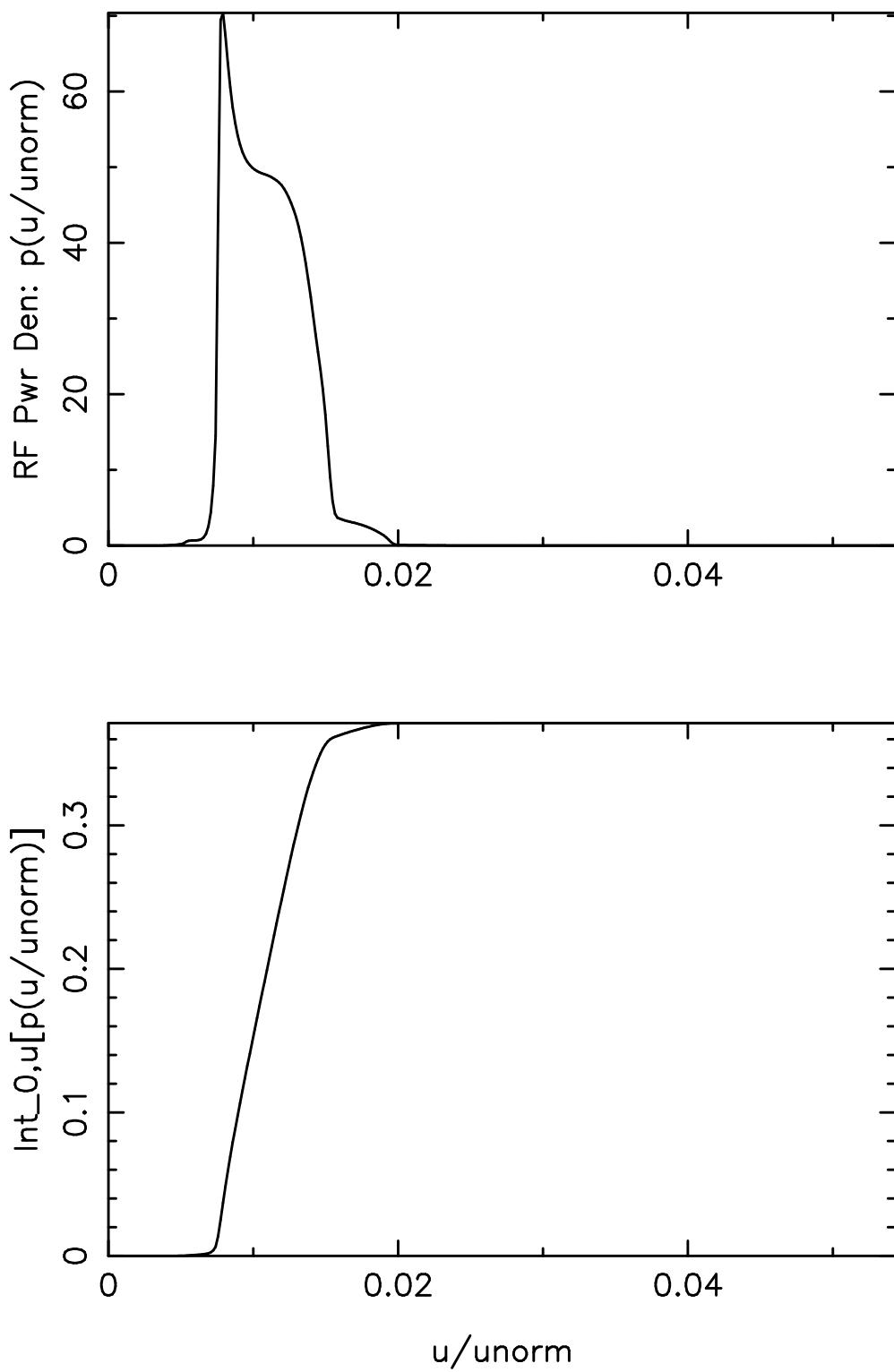


Electric field = 0.0000E+00 (V/cm)
FSA current den of species 1 = 6.6187E+01 Amps/cm**2

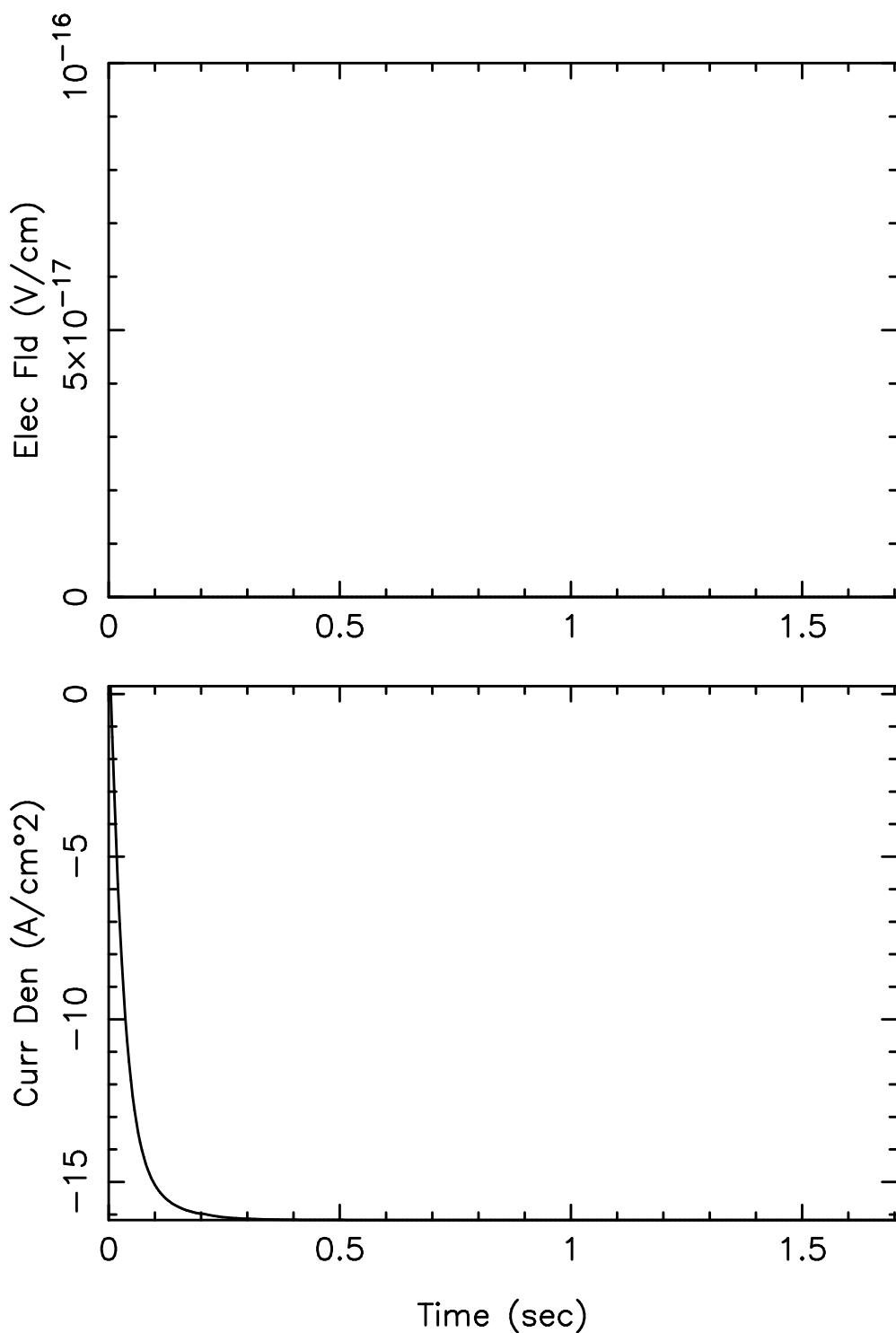
Current drive efficiency $j/(2\pi R \cdot prf)$ = 1.5985E-01 A/W



Species: 1 Current = $0.6619E+02$ Amps/cm 2

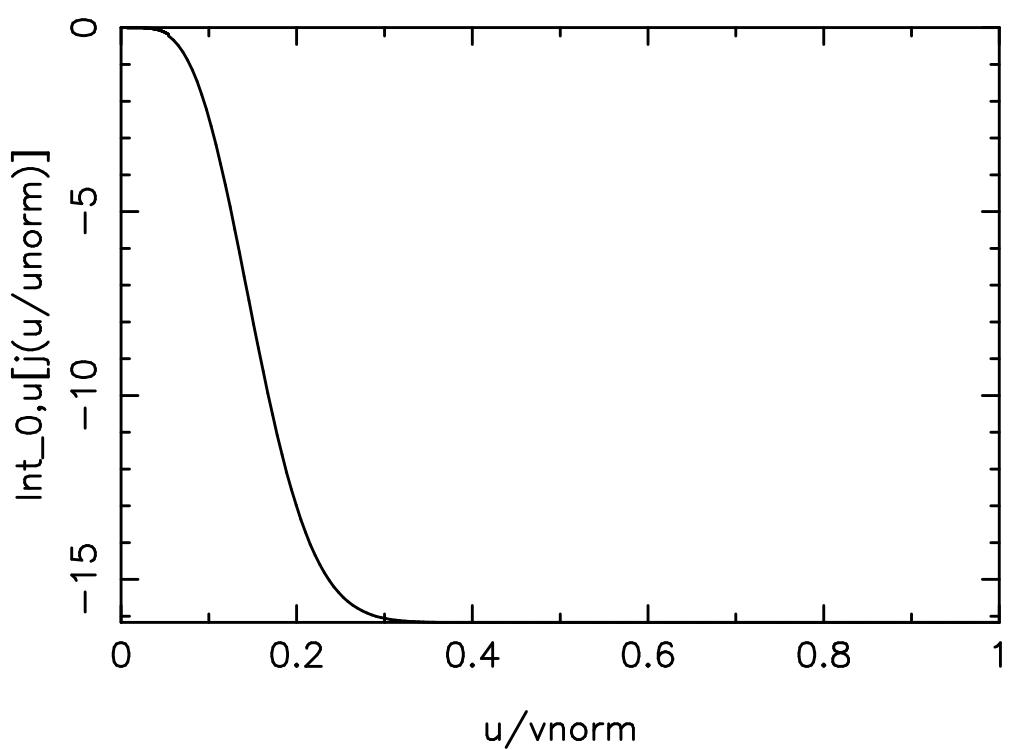
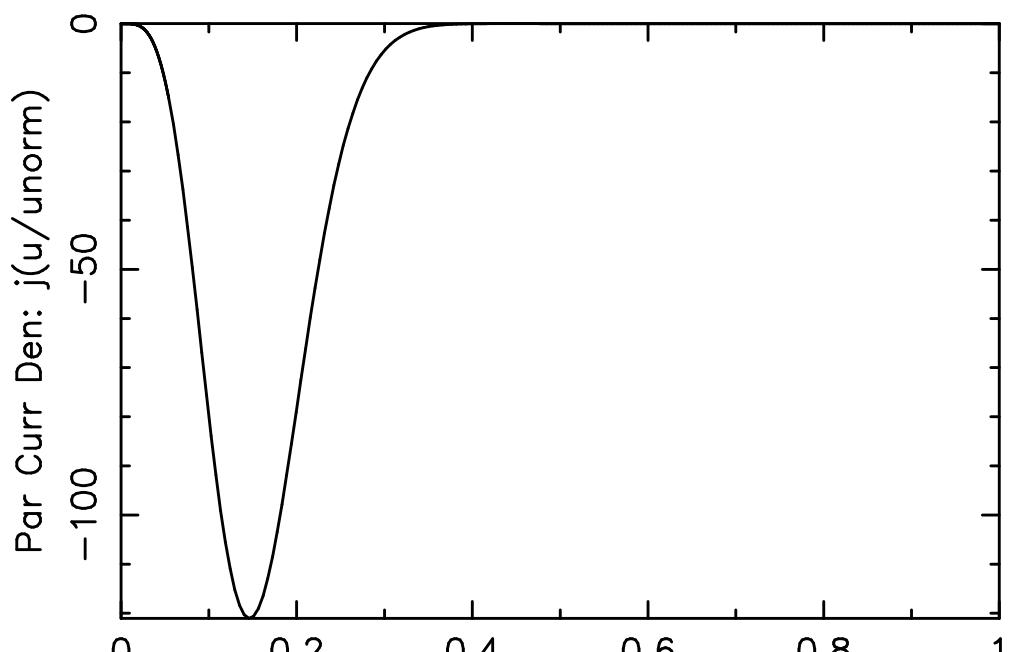


Species: 1 Power =0.3712E+00 Watts/cc

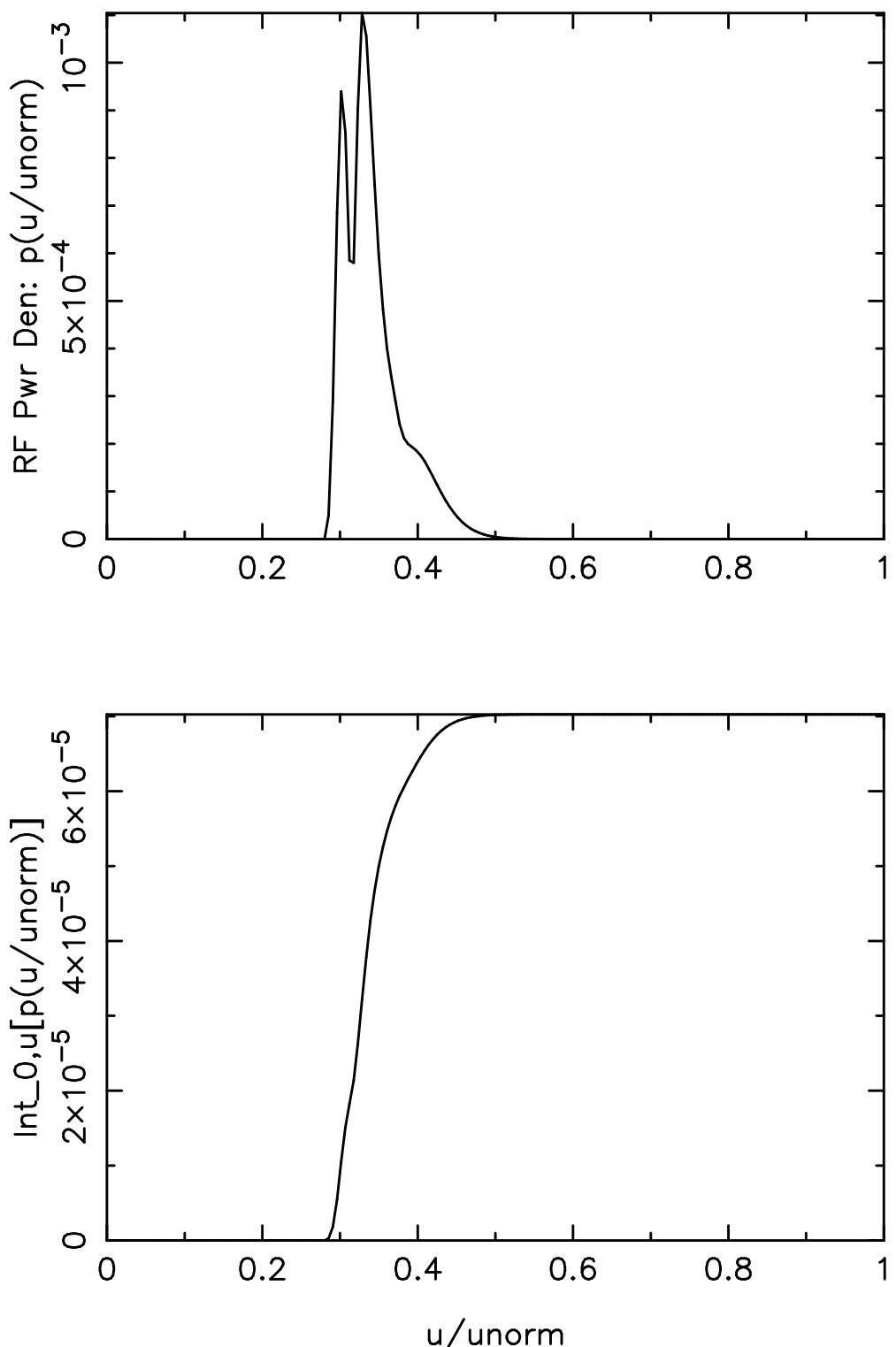


Electric field = 0.0000E+00 (V/cm)
 FSA current den of species 2 = -1.6171E+01 Amps/cm**2

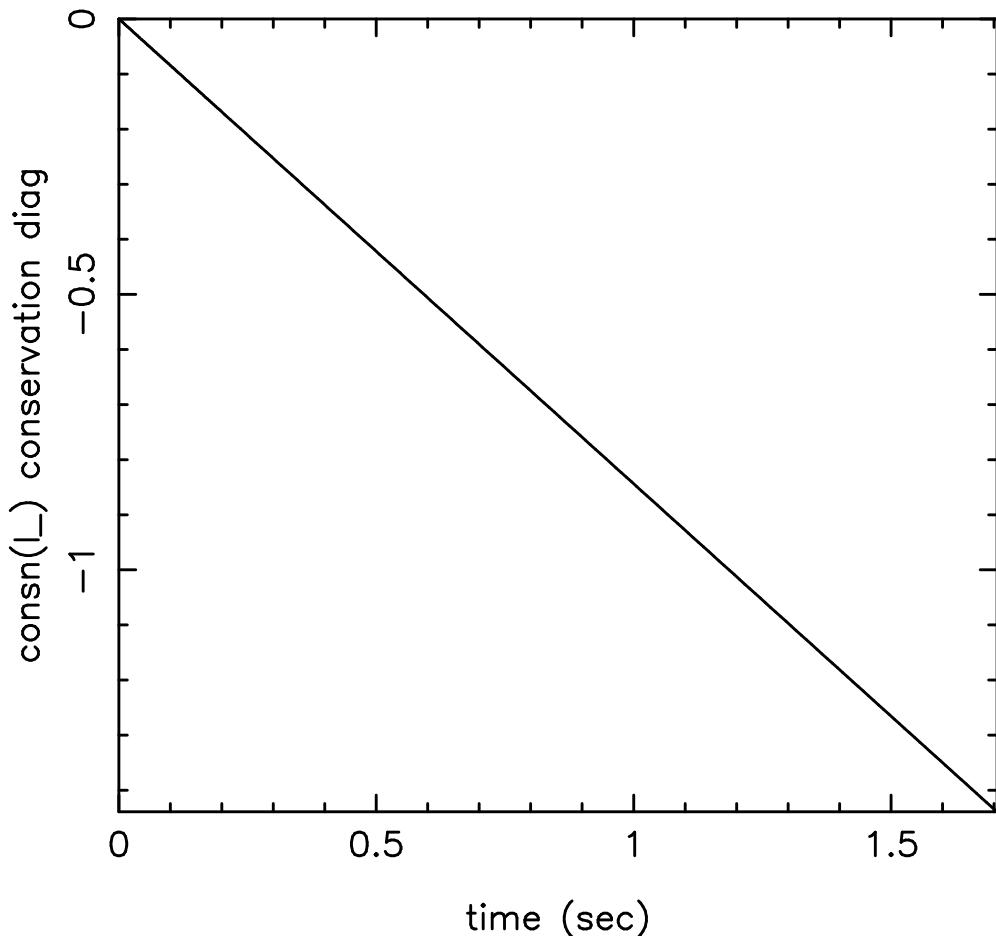
Current drive efficiency $j/(2\pi R \cdot prf)$ = -2.0636E+02 A/W
 Electron current (units $ne \cdot q \cdot v_{th}(kelec, lr_*)$) = -6.0690E-04
 power (units: $ne \cdot v_{th}(kelec, lr_*)^2 \cdot me \cdot nu0$) = 2.1989E-08
 efficiency (j/p) (Fisch 1978 units) = -2.7600E+04
 efficiency (j/p) ($e/(m \cdot c \cdot nu_c$ units) = -2.3849E+02
 $v_{th}(kelec, lr_*) = \sqrt{T/m}$ = 2.7868E+09 cm/sec
 $nu0 = 7.5617E+04$ Hz



Species: 2 Current =-.1617E+02 Amps/cm²



Species: 2 Power =0.7026E-04 Watts/cc

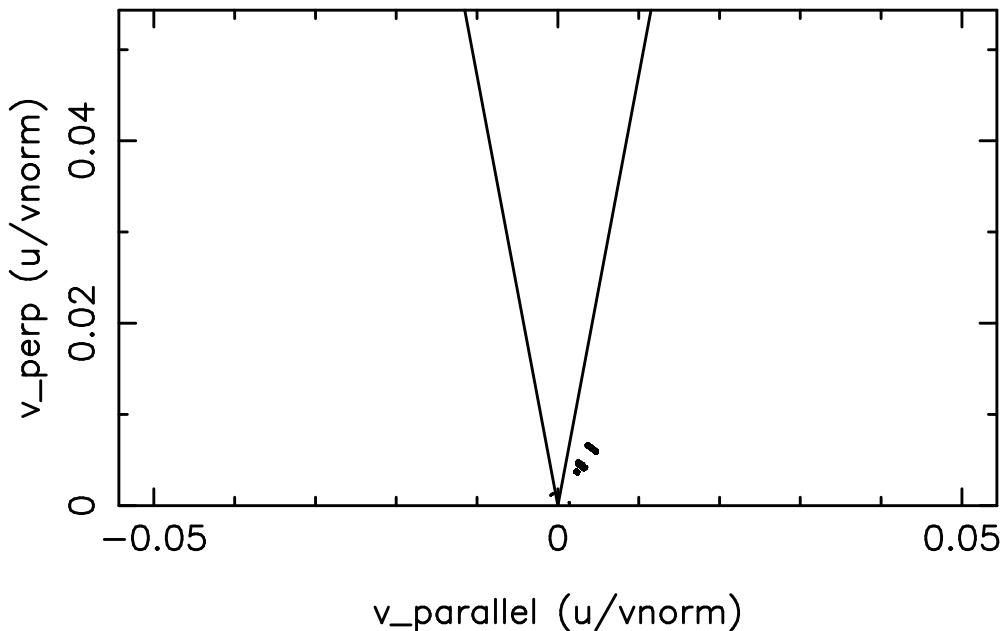


consn(l_)= -1.4394E+00

Perfect conservation should yield machine accuracy,
or about 1.e-14:

time step (n) is 200 time= 1.7060E+00 secs
r/a= 5.8571E-02 radial position (R) = 1.8156E+02 cm

Species 1 Source Function (units: dist. f/sec)



time step n= 200 time= 1.71E+00 secs
 $r/a = 5.857E-02$ radial position (R)= 1.8156E+02 cm
 $rya = 5.857E-02$ R=rpcon= 1.8156E+02 cm, Surf# 8

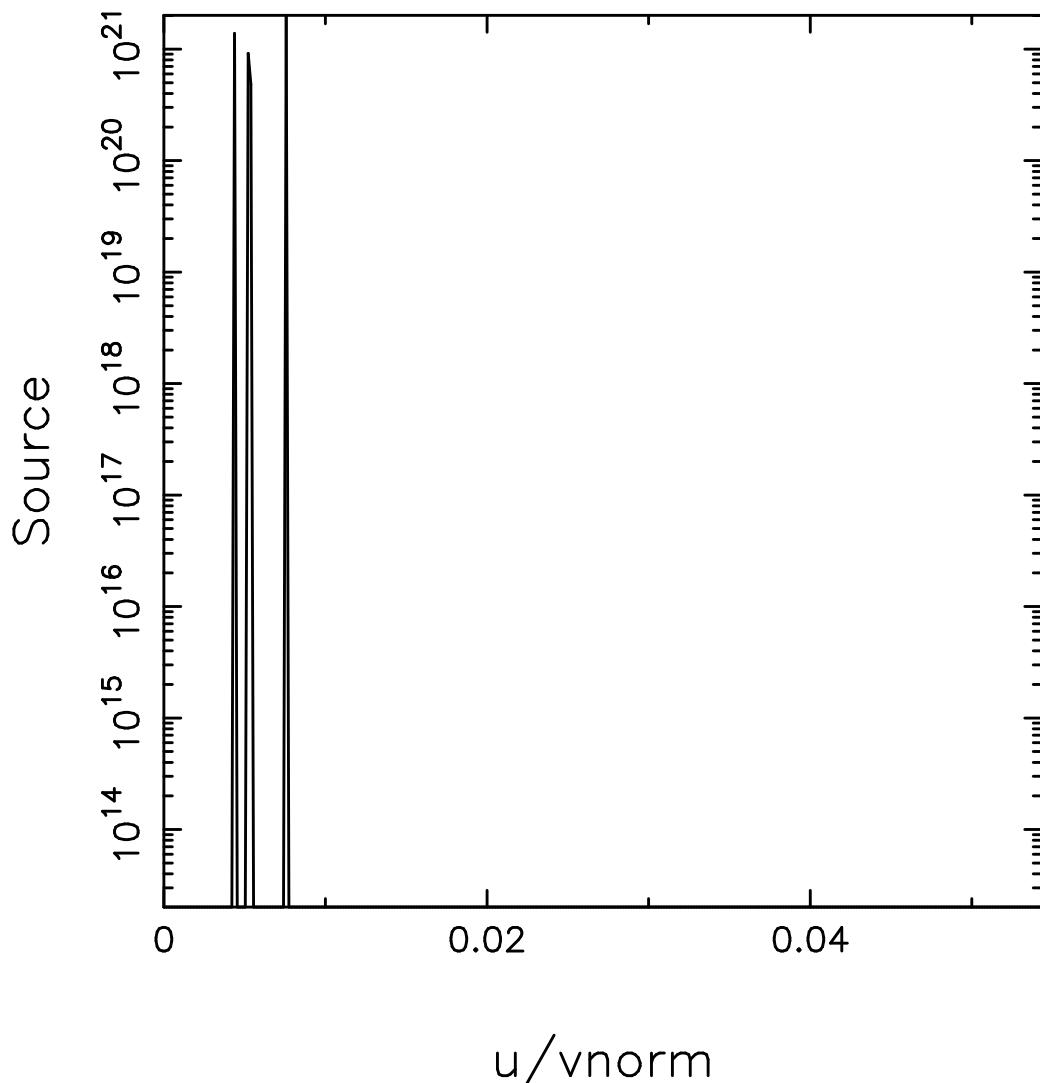
Particle source rate= 1.0075E+14 ptcls/cc/sec

Total source power [entr(..5..)]= 1.0425E+00 W/cc

Contour values:

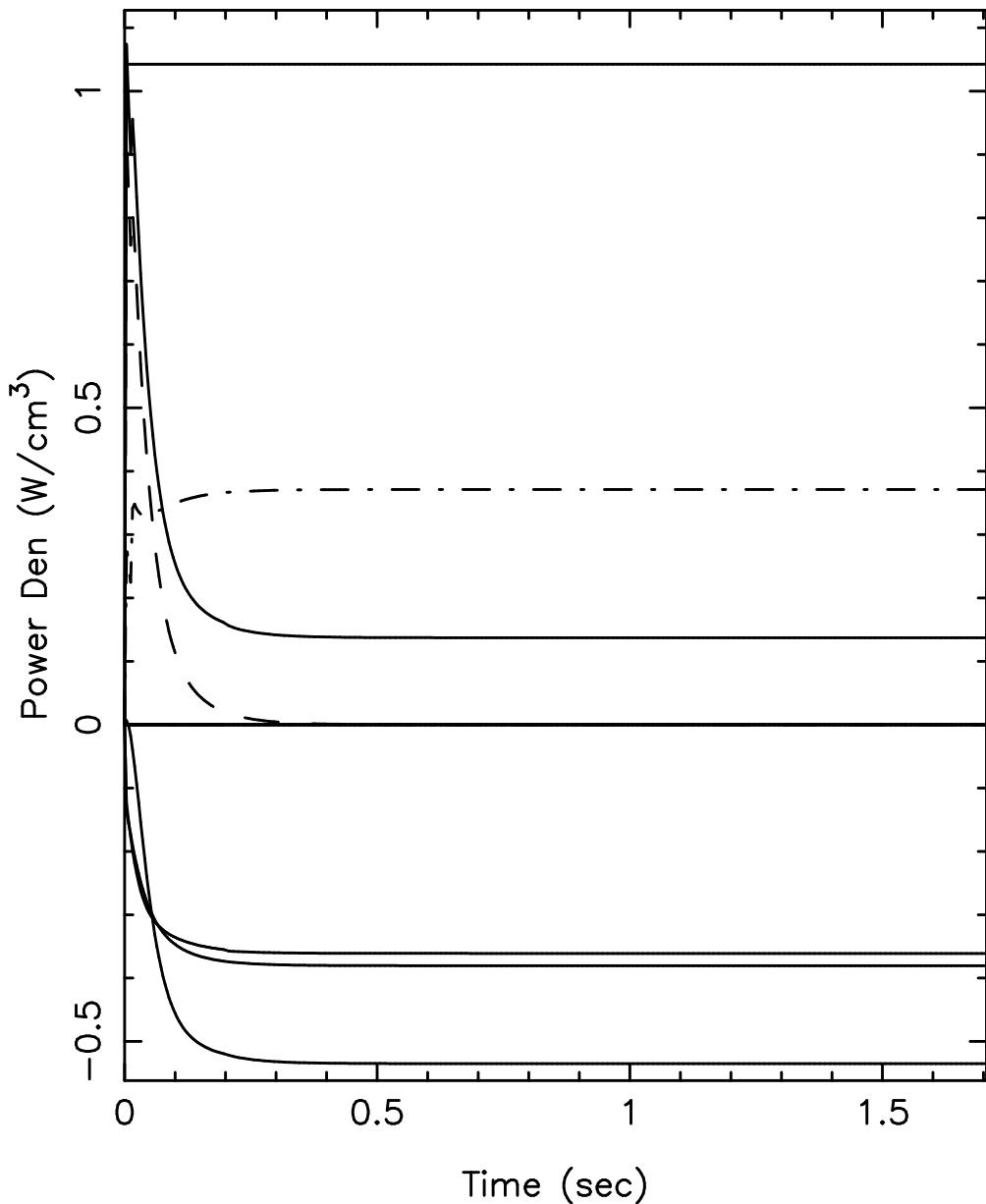
| | | | |
|------------|------------|------------|------------|
| 4.4414E+10 | 1.7682E+11 | 7.0391E+11 | 2.8023E+12 |
| 1.1156E+13 | 4.4414E+13 | 1.7682E+14 | 7.0391E+14 |
| 2.8023E+15 | 1.1156E+16 | 4.4414E+16 | 1.7682E+17 |
| 7.0391E+17 | 2.8023E+18 | 1.1156E+19 | 4.4414E+19 |
| 1.7682E+20 | 7.0391E+20 | 2.8023E+21 | 1.1156E+22 |

Pitch Angle Avg Source vs. u

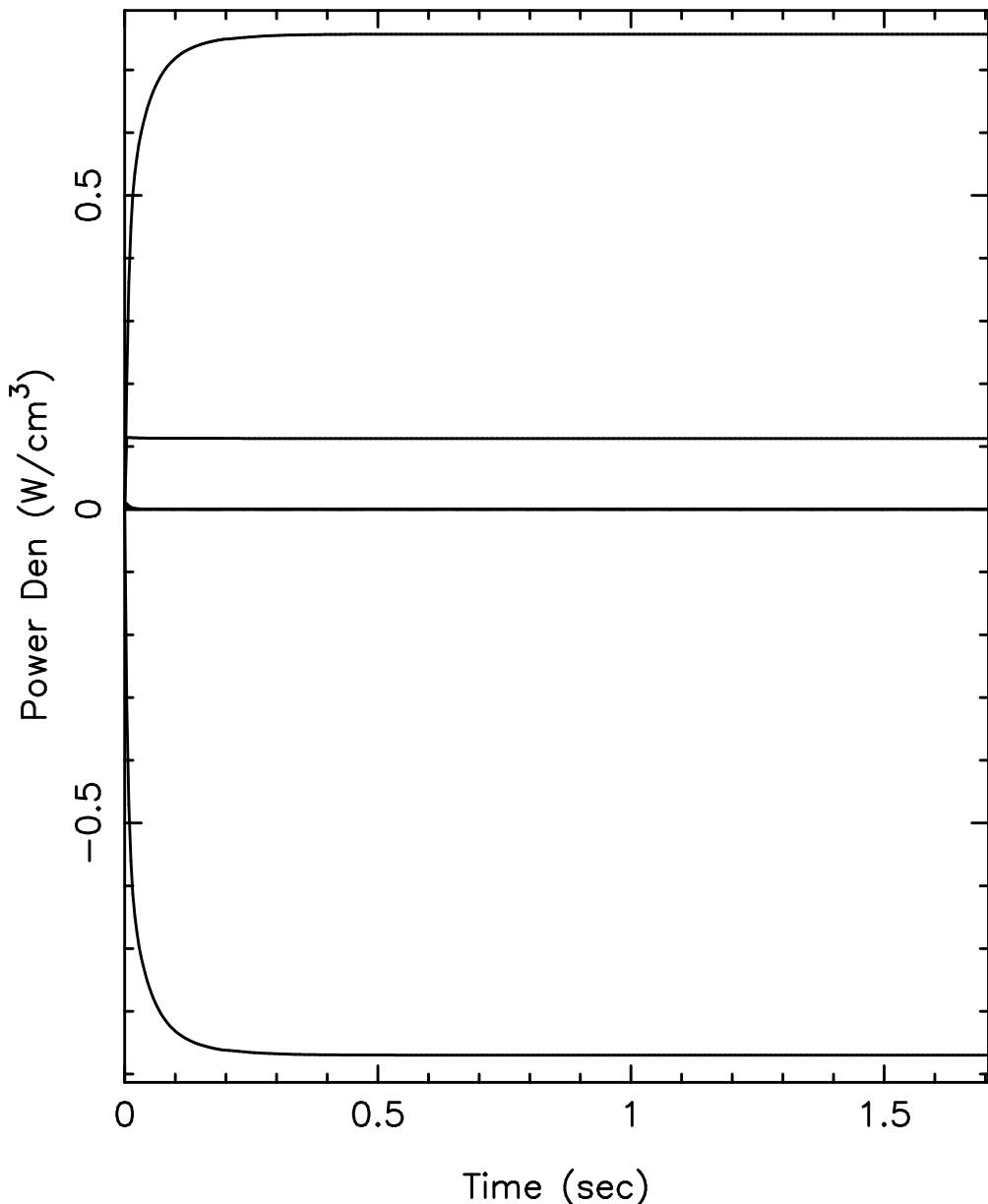


Particle source integrated over theta0 for species 1
(normed so int(0,1)*2pi*x**2*dx=mid-plane source)
vnorm= 3.6947E+10 cm/s

time step (n) is 200 time= 1.7060E+00 secs
r/a= 5.8571E-02 radial position (R) = 1.8156E+02 cm

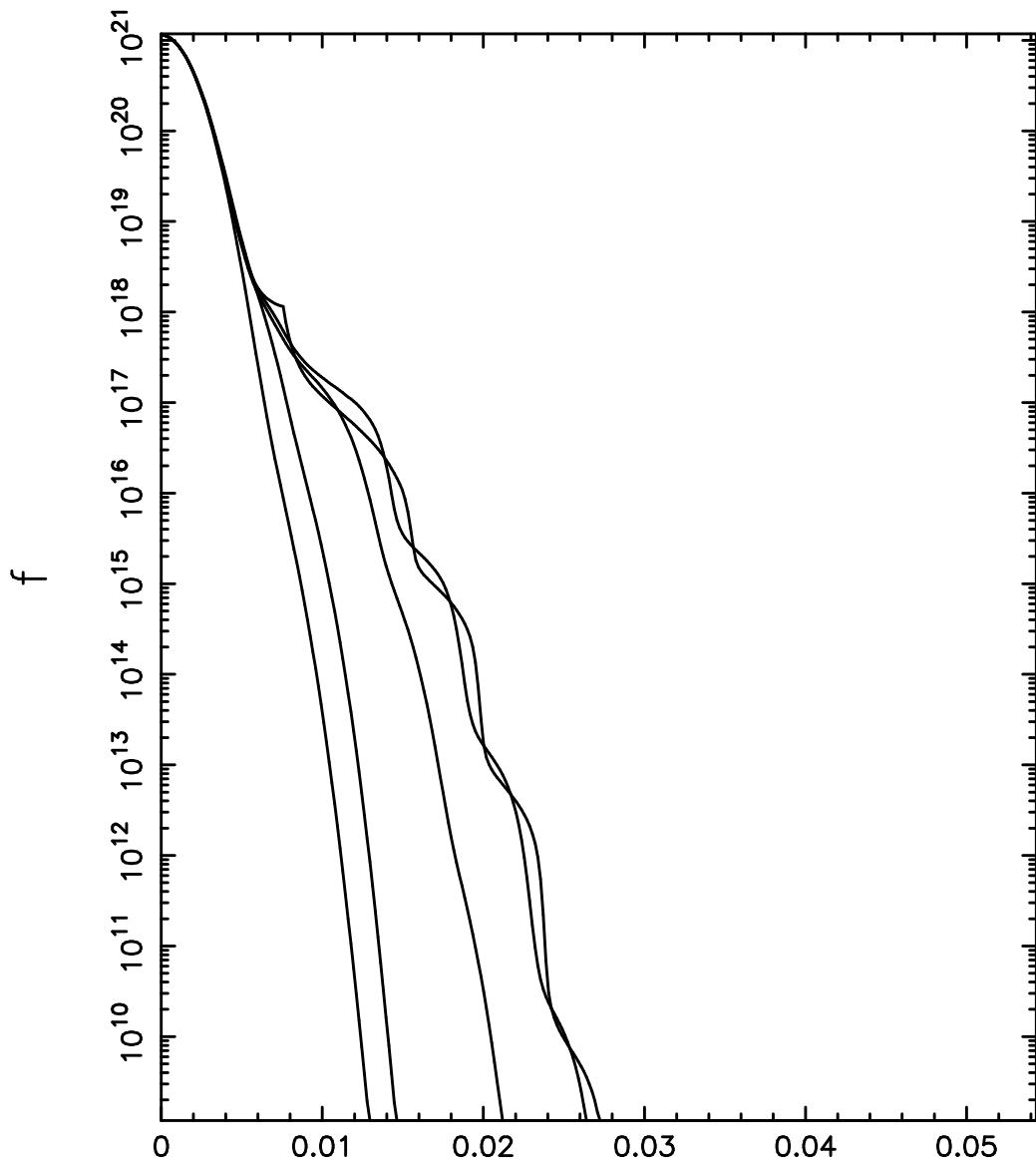


Species k= 1 Final powers in Watts/cc are:
 sum over all comp= 1.37E-01 From df/dt : 5.94E-06
 collisional transfer from Maxwellian elec.= -3.80E-01
 collisional transfer from Maxwellian ions= -5.35E-01
 collisional transfer from gens.= -3.61E-01
 ohmic drive= 0.00E+00
 RF drive= 3.71E-01
 particle sources= 1.04E+00
 loss-lossmode(k)= 3.03E-15 losses-torloss(k)= -1.32E-91
 losses due to runaway= 0.00E+00
 setting neg f to zero= 8.13E-57
 synchrotron rad losses= 0.00E+00
 phenomenological energy losses= 0.00E+00



Species k= 2 Final powers in Watts/cc are:
 sum over all comp= -8.91E-10 From df/dt : -7.78E-10
 collisional transfer from Maxwellian elec.= -8.70E-01
 collisional transfer from Maxwellian ions= 1.13E-01
 collisional transfer from gens.= 7.57E-01
 ohmic drive= 0.00E+00
 RF drive= 7.02E-05
 particle sources= 0.00E+00
 loss-lossmode(k)= 0.00E+00 losses-torloss(k)= -6.42E-92
 losses due to runaway= 0.00E+00
 setting neg f to zero= 0.00E+00
 synchrotron rad losses= 0.00E+00
 phenomenological energy losses= 0.00E+00

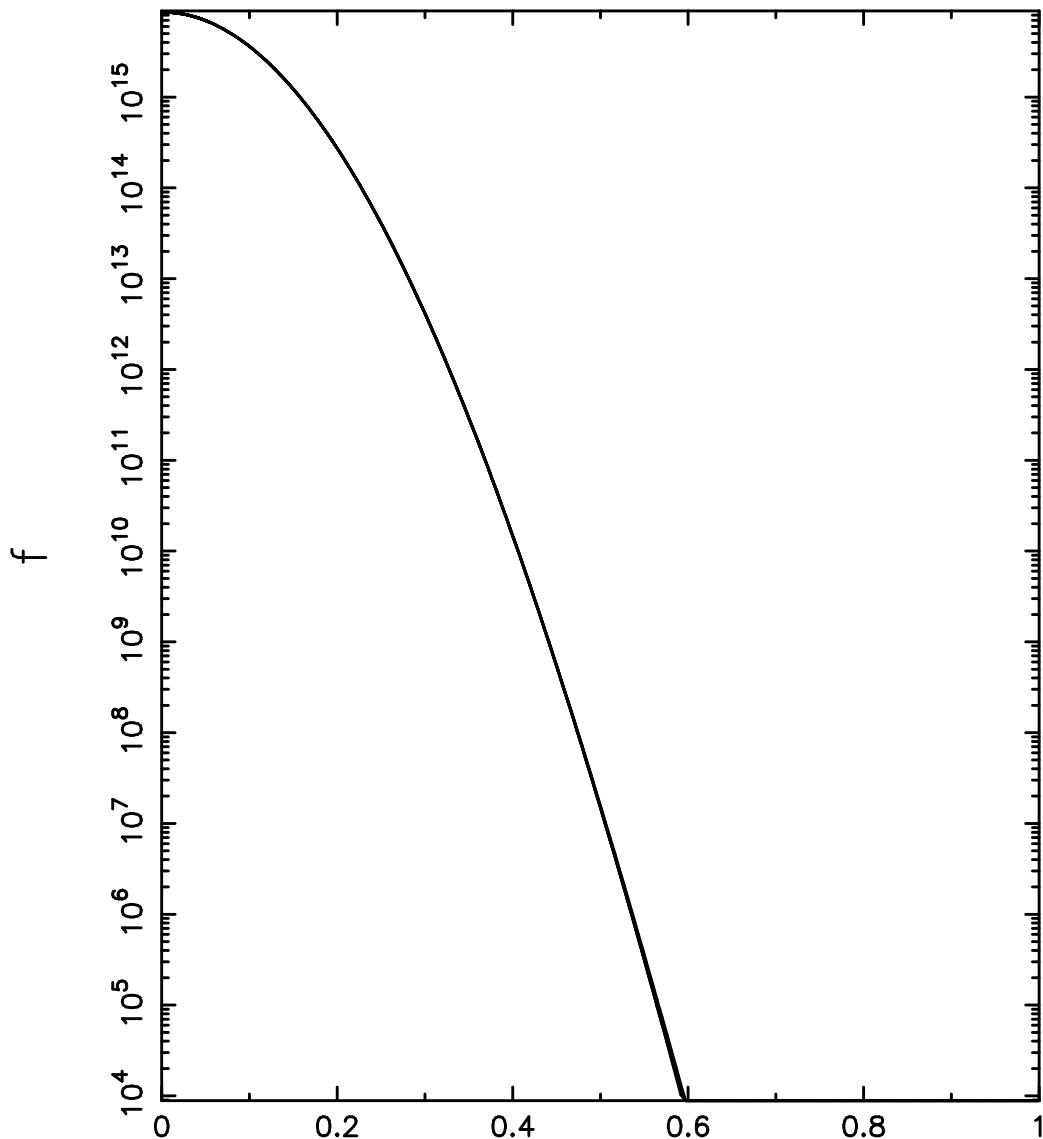
Cuts of f vs. v , at cnst pitch angle



u/v_{norm}

Distribution function vs. velocity for some angles
Species number=1, enorm= 3.00D+02
time step (n)= 200 time= 0.170600E+01 secs
 $r/a = 5.86E-02$ radial position(R)= 1.816E+02 cm

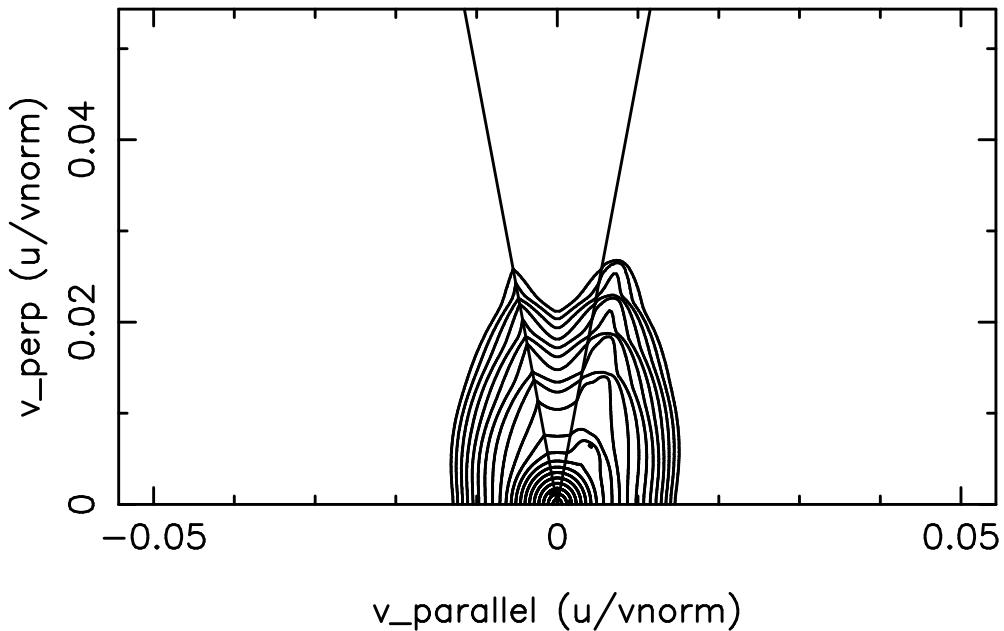
Cuts of f vs. v, at cnst pitch angle



u/v_{norm}

Distribution function vs. velocity for some angles
Species number=2, enorm= 3.00D+02
time step (n)= 200 time= 0.170600E+01 secs
r/a= 5.86E-02 radial position(R)= 1.816E+02 cm

Species 1 Distribution Function Contour Plot

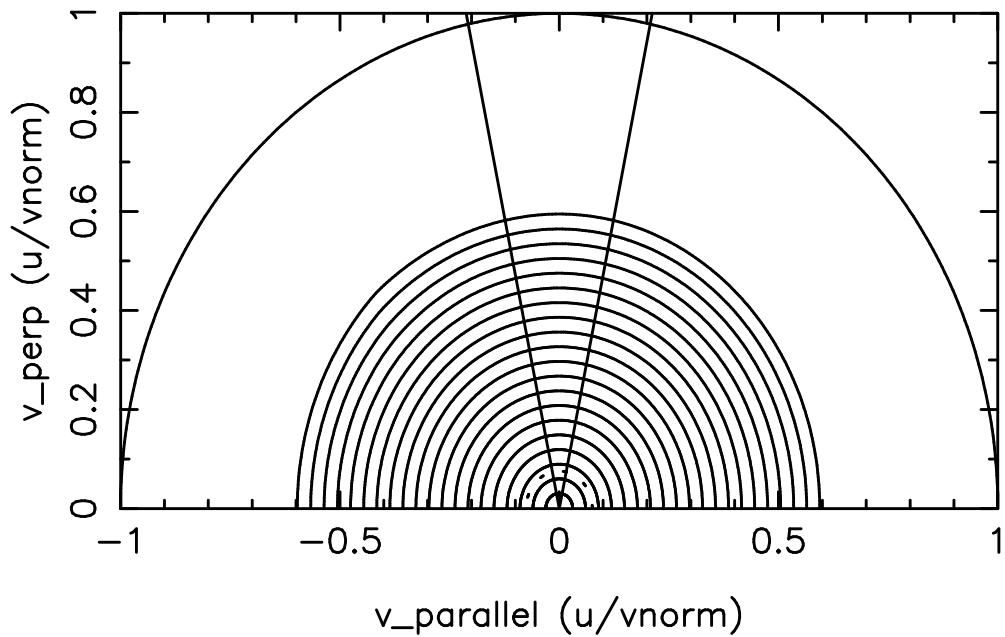


time step n= 200 time= 1.71E+00 secs
 $r/a = 5.857E-02$ radial position (R)= 1.8156E+02 cm
 $rya = 5.857E-02$ R=rpcon= 1.8156E+02 cm, Surf# 8

Contour values:

| | | | |
|--------------|--------------|--------------|--------------|
| 1.058176E+21 | 8.326683E+20 | 5.592798E+20 | 3.213374E+20 |
| 1.583939E+20 | 6.722592E+19 | 2.467170E+19 | 7.866734E+18 |
| 2.190649E+18 | 5.357007E+17 | 1.156981E+17 | 2.219855E+16 |
| 3.806087E+15 | 5.865965E+14 | 8.173768E+13 | 1.035583E+13 |
| 1.199526E+12 | 1.277003E+11 | 1.255826E+10 | 1.146349E+09 |

Species 2 Distribution Function Contour Plot



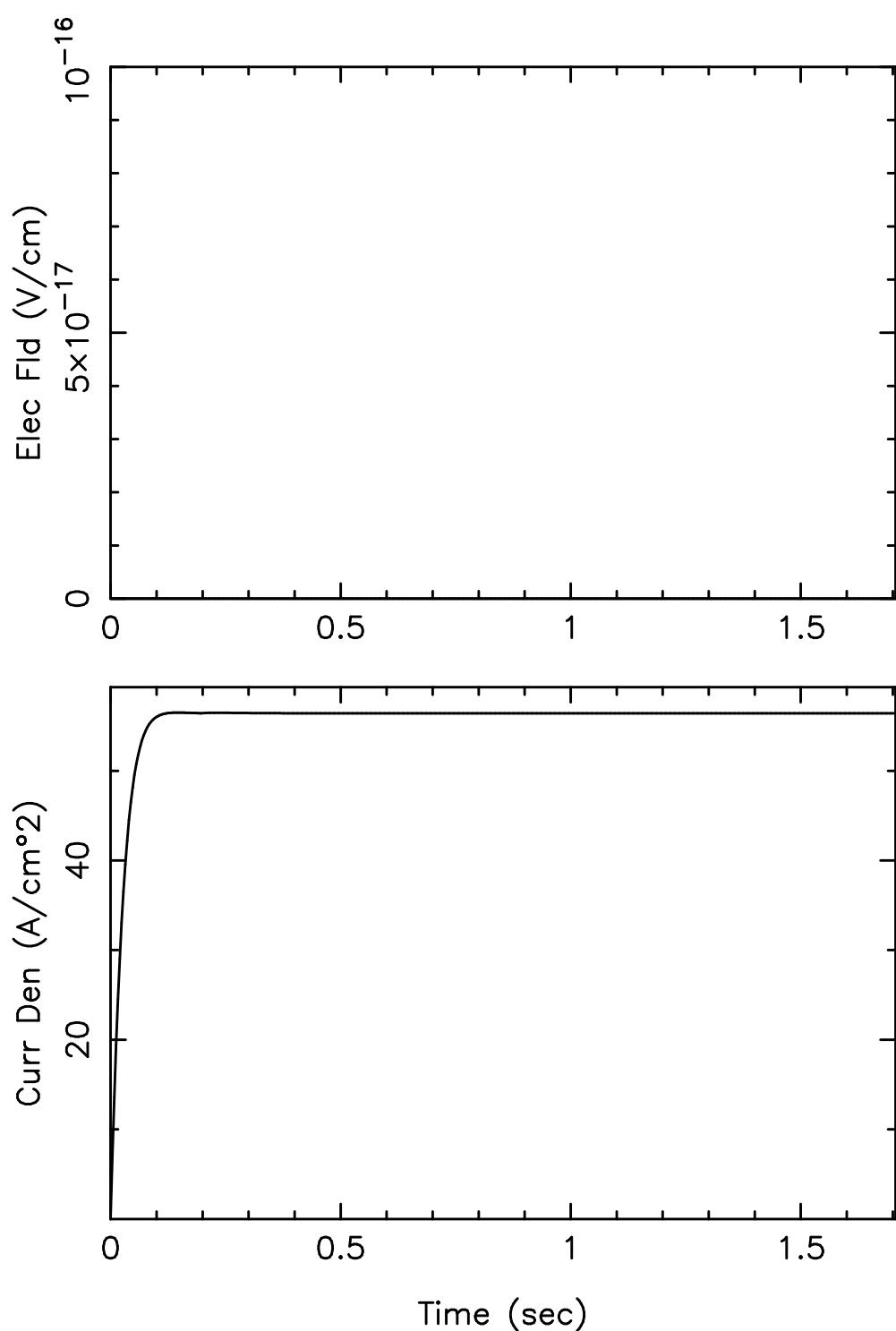
time step n= 200 time= 1.71E+00 secs
 $r/a = 5.857E-02$ radial position (R)= 1.8156E+02 cm
 $rya = 5.857E-02$ R=rpcon= 1.8156E+02 cm, Surf# 8

Contour values:

| | | | |
|--------------|--------------|--------------|--------------|
| 7.969255E+15 | 6.321809E+15 | 4.301885E+15 | 2.514940E+15 |
| 1.265757E+15 | 5.498678E+14 | 2.068185E+14 | 6.758743E+13 |
| 1.926503E+13 | 4.809664E+12 | 1.056385E+12 | 2.050662E+11 |
| 3.534995E+10 | 5.437495E+09 | 7.499457E+08 | 9.319270E+07 |
| 1.048417E+07 | 1.072828E+06 | 1.003153E+05 | 8.609697E+03 |

LOCAL RADIAL QUANTITIES

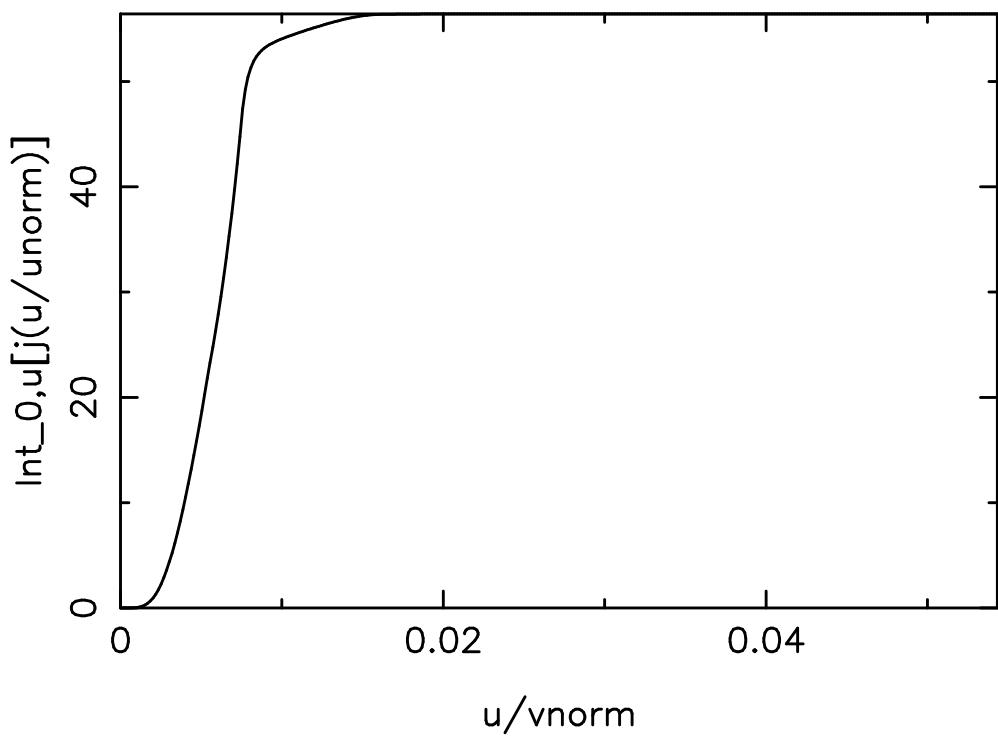
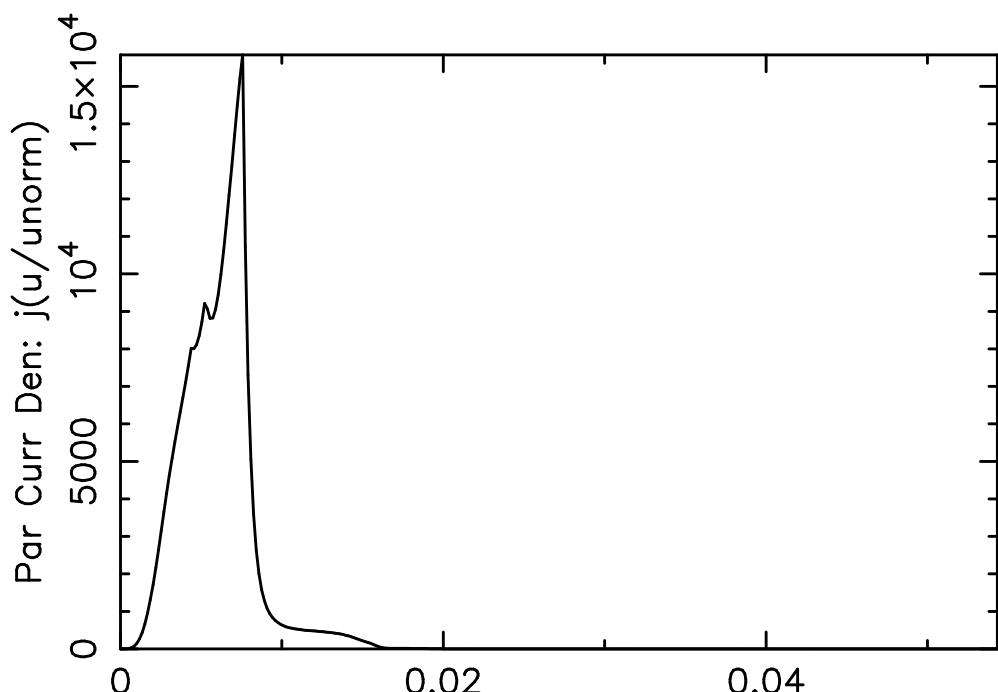
```
time step n= 200,      time= 1.7060E+00 secs
flux surf= 9      total flux surfs= 65
r/a= 6.551E-02      radial position (R)= 1.8200E+02 cms
rya= 6.551E-02      R=rpcon= 1.820E+02 cm
    enormi, enorme(=enorm) (kev) = 3250.000   300.000
vnorm/c = 1.2324136
vthe (sqrt(te/me))/c = 0.0928870
vthe/vnorm = 0.0753700
k= 1 vth(k)/vnorm = 0.0014365
k= 2 vth(k)/vnorm = 0.0753700
k= 3 vth(k)/vnorm = 0.0014365
k= 4 vth(k)/vnorm = 0.0001435
k= 5 vth(k)/vnorm = 0.0753700
```



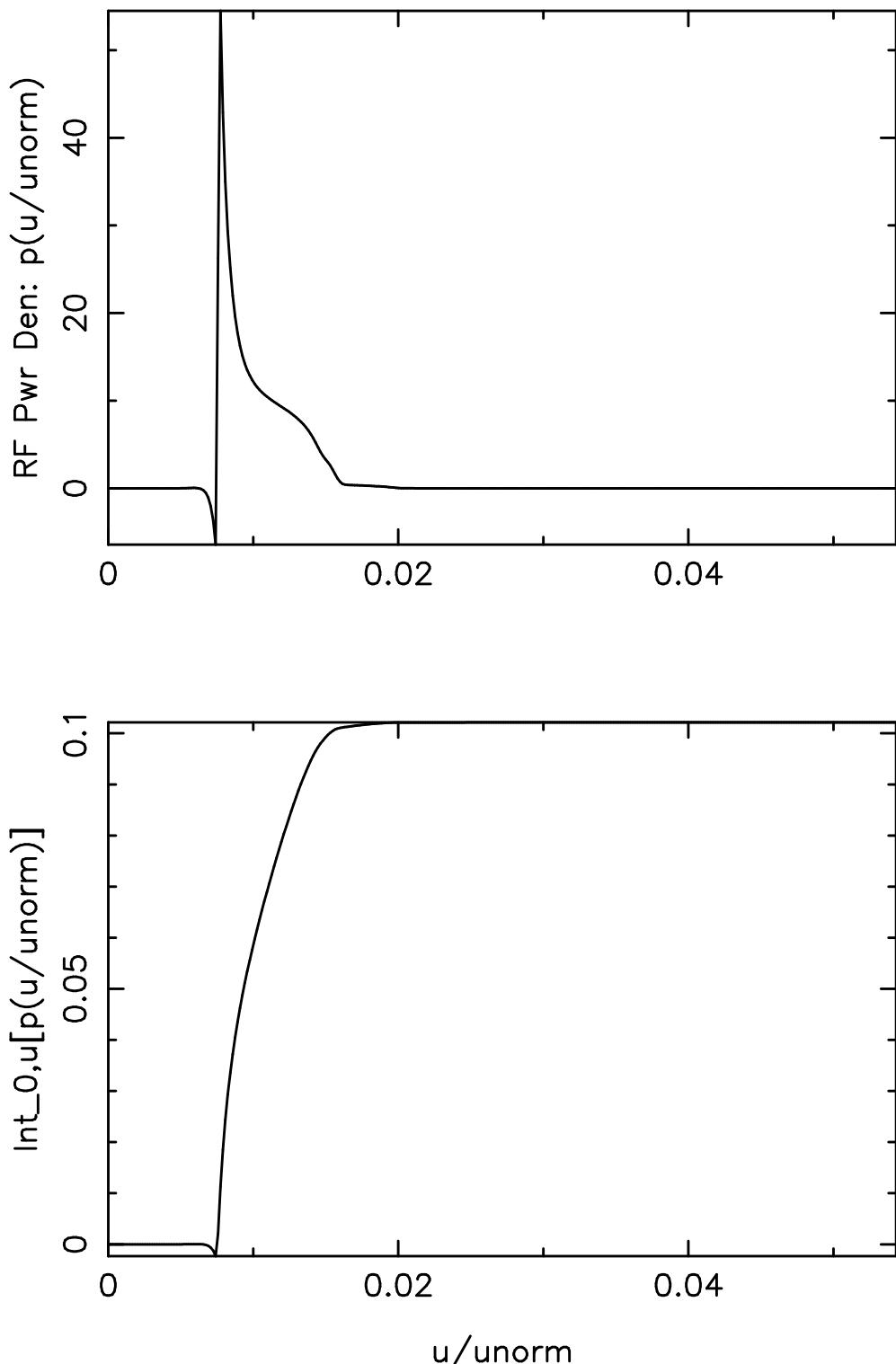
Electric field = 0.0000E+00 (V/cm)

FSA current den of species 1 = 5.6420E+01 Amps/cm**2

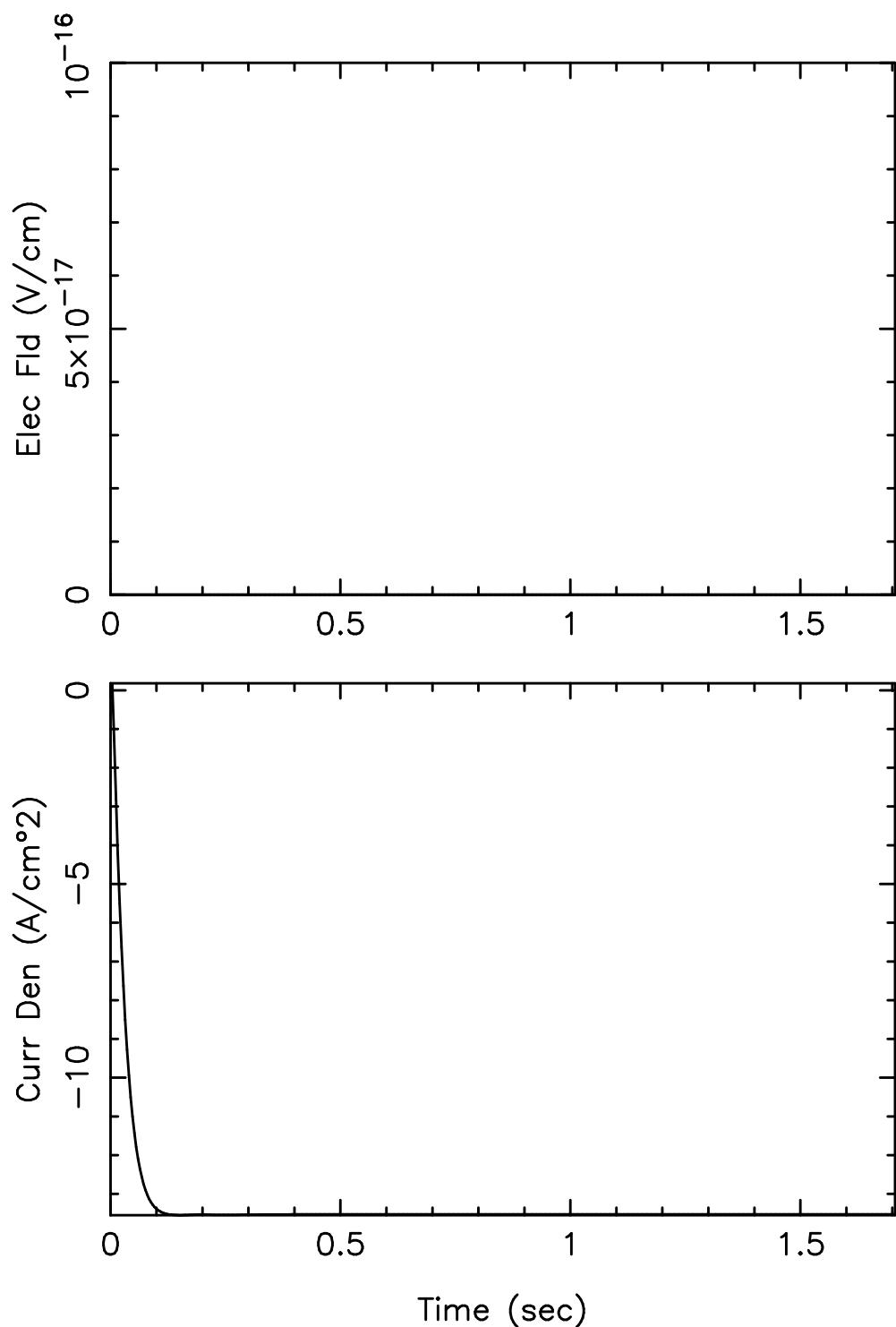
Current drive efficiency $j/(2\pi R \rho r_f)$ = 4.9544E-01 A/W



Species: 1 Current = 0.5642E+02 Amps/cm 2

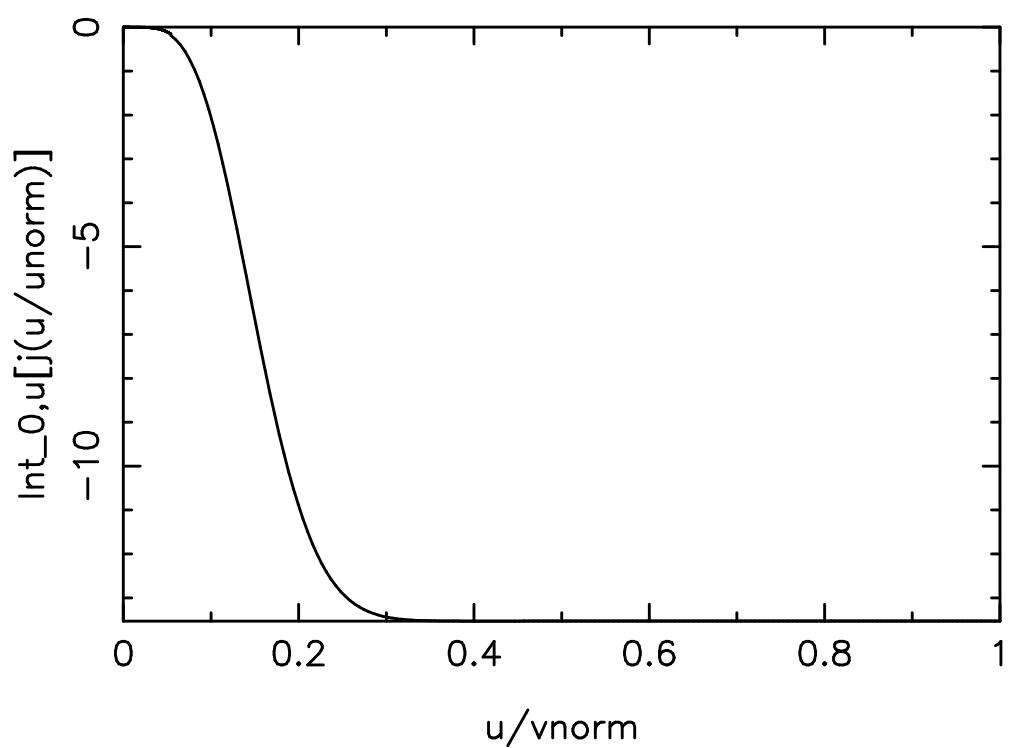
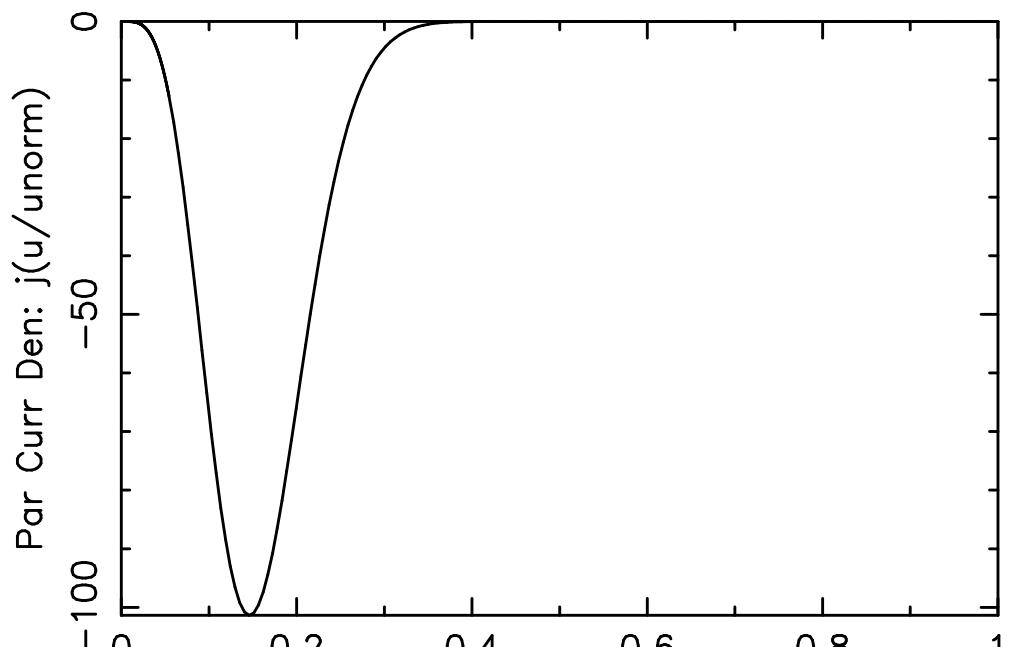


Species: 1 Power =0.1021E+00 Watts/cc

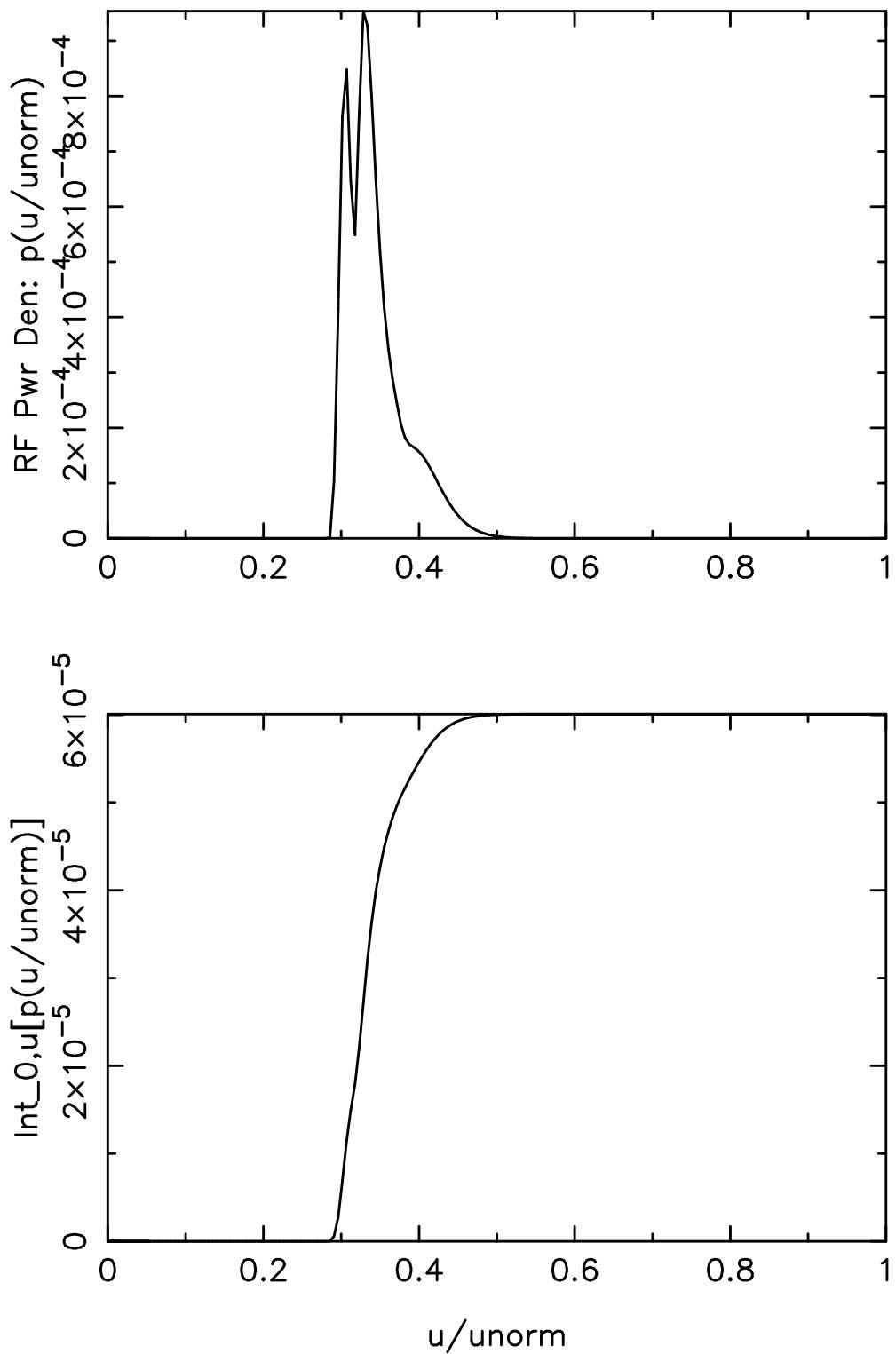


Electric field = 0.0000E+00 (V/cm)
 FSA current den of species 2 = -1.3529E+01 Amps/cm**2

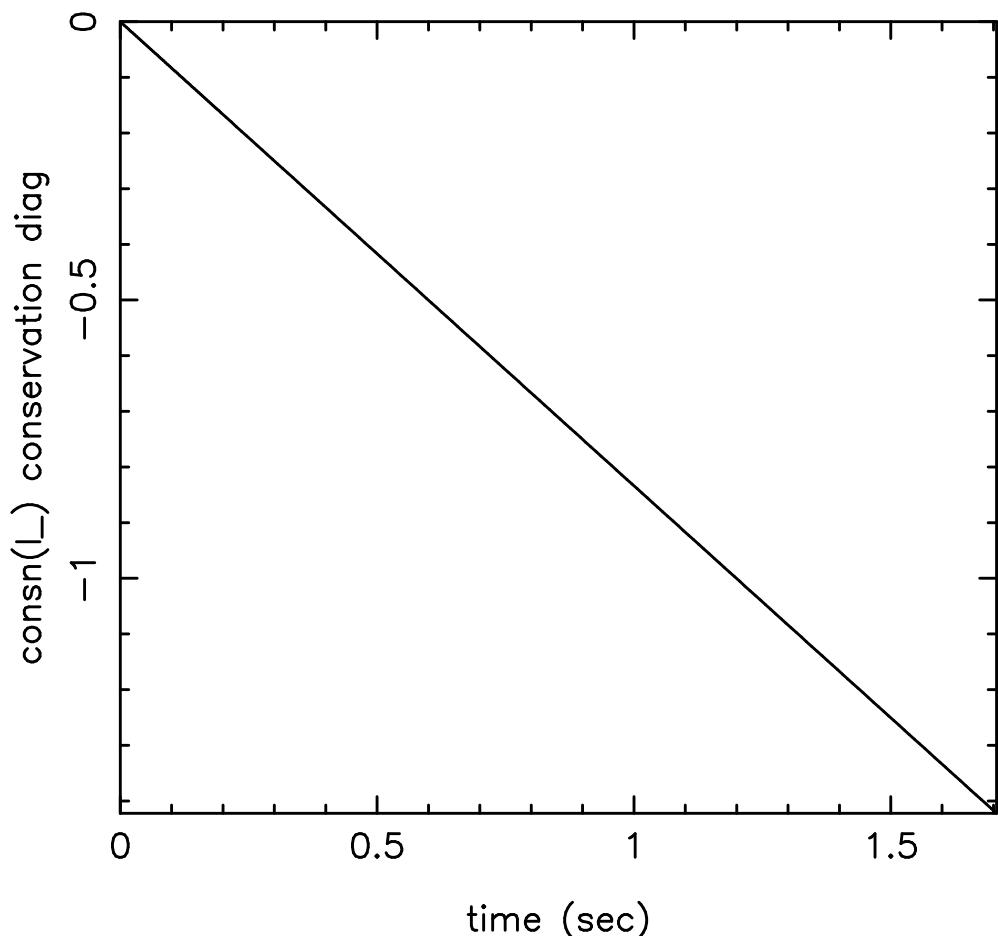
Current drive efficiency $j/(2\pi R \cdot prf)$ = -2.0196E+02 A/W
 Electron current (units $ne \cdot q \cdot v_{th}(kelec, lr_*)$) = -5.0871E-04
 power (units: $ne \cdot v_{th}(kelec, lr_*)^2 \cdot 2 \cdot me \cdot nu_0$) = 1.8832E-08
 efficiency (j/p) (Fisch 1978 units) = -2.7014E+04
 efficiency (j/p) ($e/(m \cdot c \cdot nu_c$ units) = -2.3308E+02
 $v_{th}(kelec, lr_*) = \sqrt{T/m} = 2.7847E+09$ cm/sec
 $nu_0 = 7.5701E+04$ Hz



Species: 2 Current =-.1353E+02 Amps/cm²



Species: 2 Power = $0.6007\text{E}-04$ Watts/cc

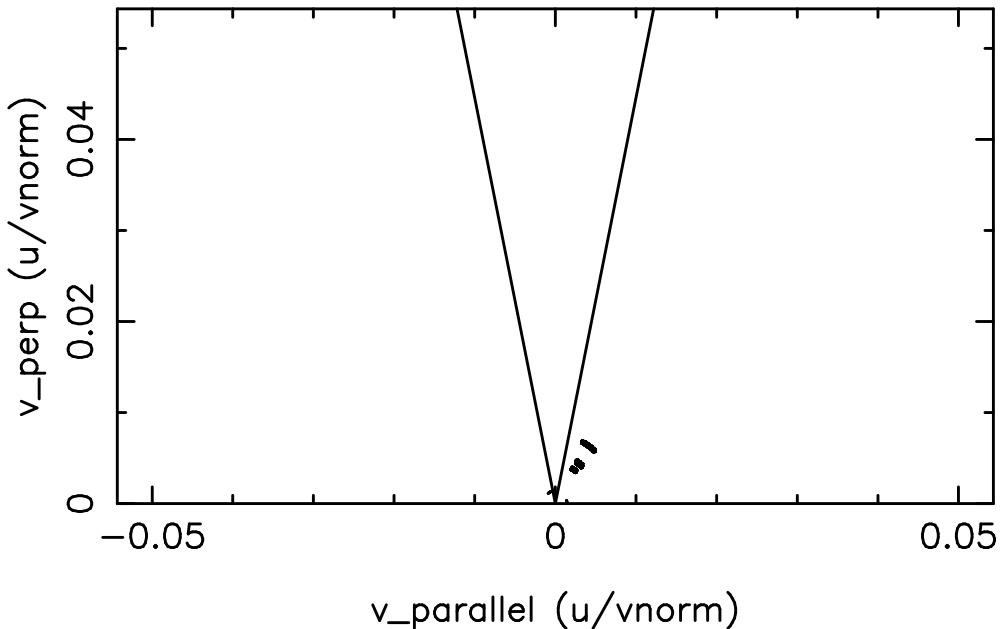


consn(l_)= -1.4224E+00

Perfect conservation should yield machine accuracy,
or about 1.e-14:

time step (n) is 200 time= 1.7060E+00 secs
r/a= 6.5510E-02 radial position (R) = 1.8200E+02 cm

Species 1 Source Function (units: dist. f/sec)



time step n= 200 time= 1.71E+00 secs
 $r/a = 6.551E-02$ radial position (R)= 1.8200E+02 cm
 $rya = 6.551E-02$ R=rpcon= 1.8200E+02 cm, Surf# 9

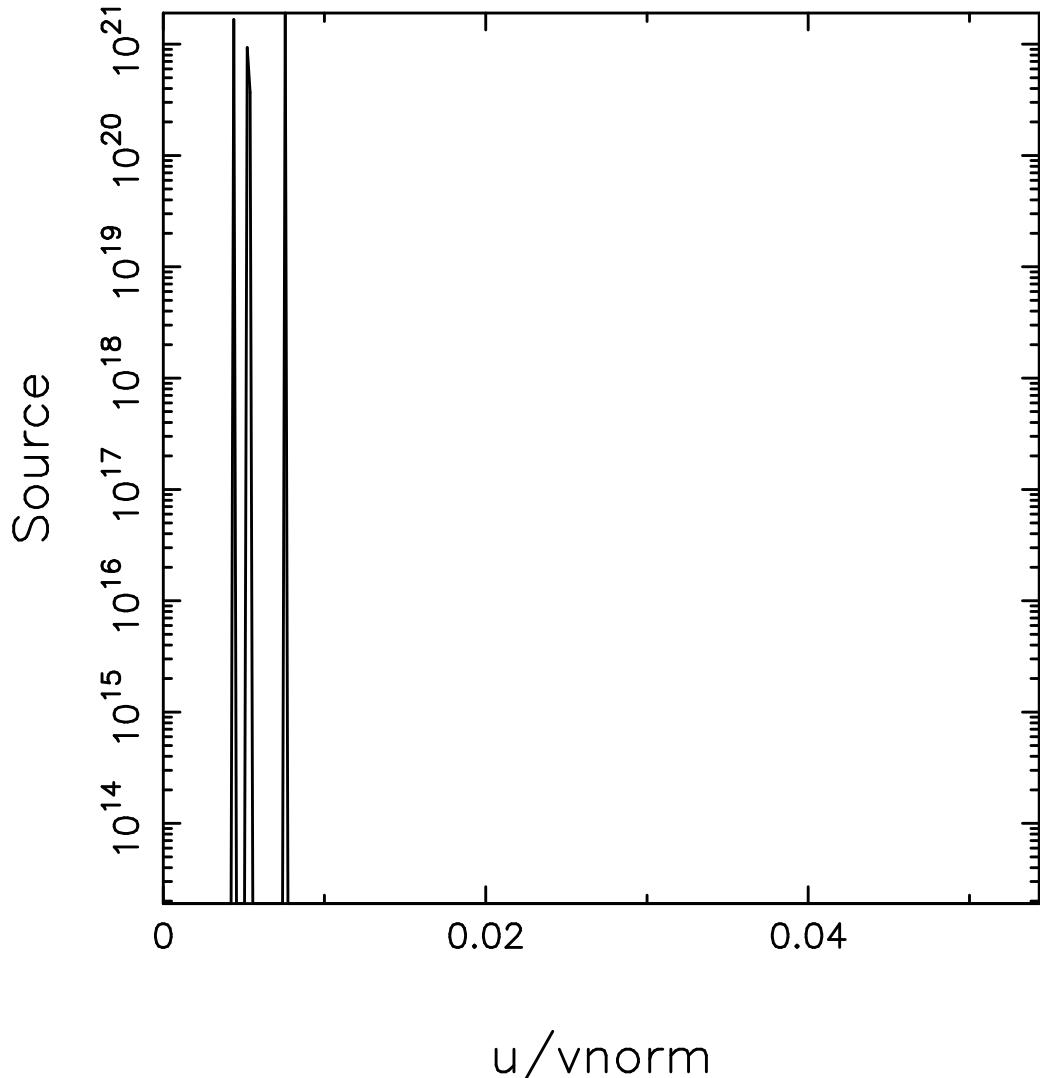
Particle source rate= 9.9452E+13 ptcls/cc/sec

Total source power [entr(..5..)]= 1.0075E+00 W/cc

Contour values:

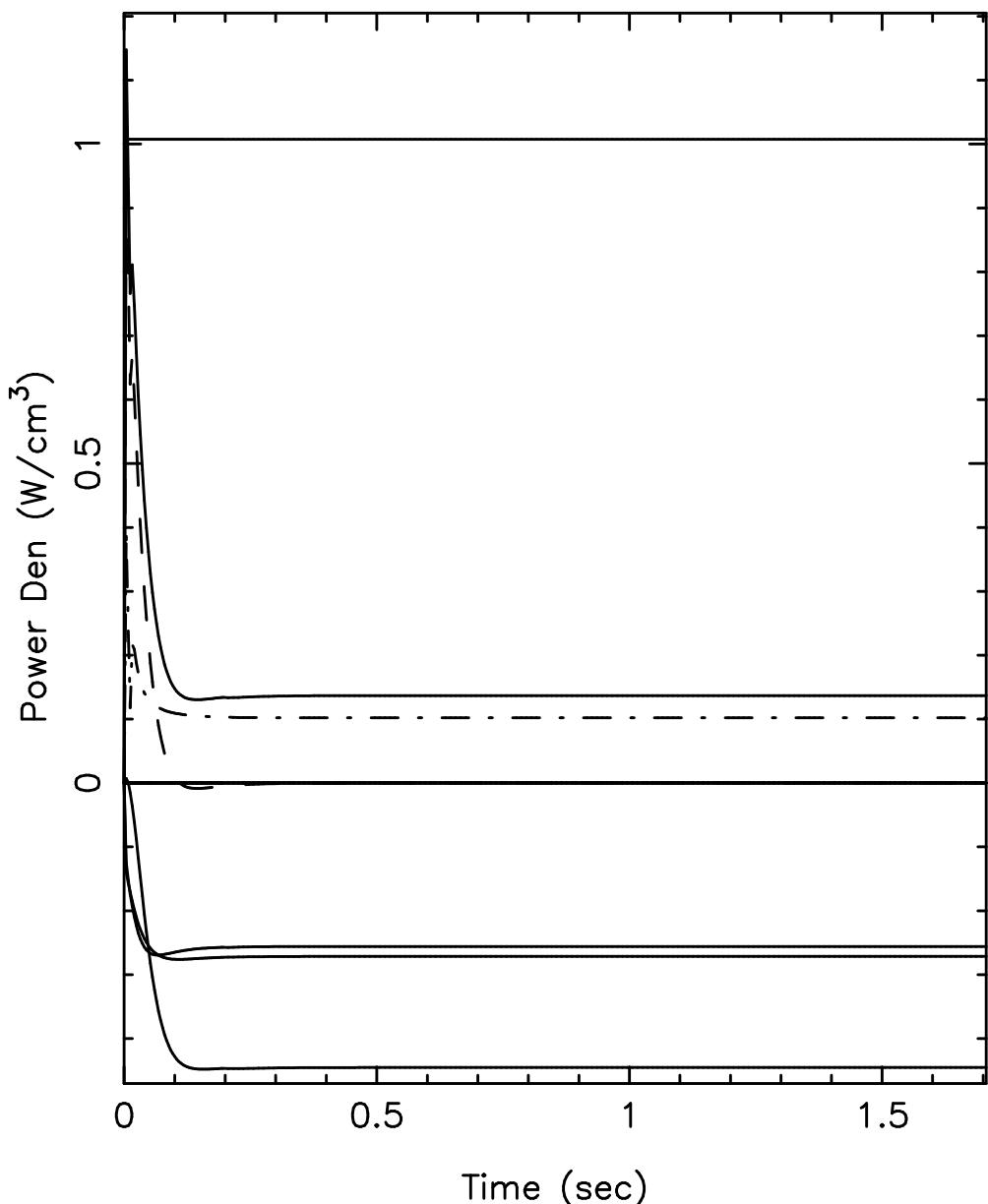
| | | | |
|------------|------------|------------|------------|
| 2.6165E+10 | 1.0416E+11 | 4.1469E+11 | 1.6509E+12 |
| 6.5723E+12 | 2.6165E+13 | 1.0416E+14 | 4.1469E+14 |
| 1.6509E+15 | 6.5723E+15 | 2.6165E+16 | 1.0416E+17 |
| 4.1469E+17 | 1.6509E+18 | 6.5723E+18 | 2.6165E+19 |
| 1.0416E+20 | 4.1469E+20 | 1.6509E+21 | 6.5723E+21 |

Pitch Angle Avg Source vs. u

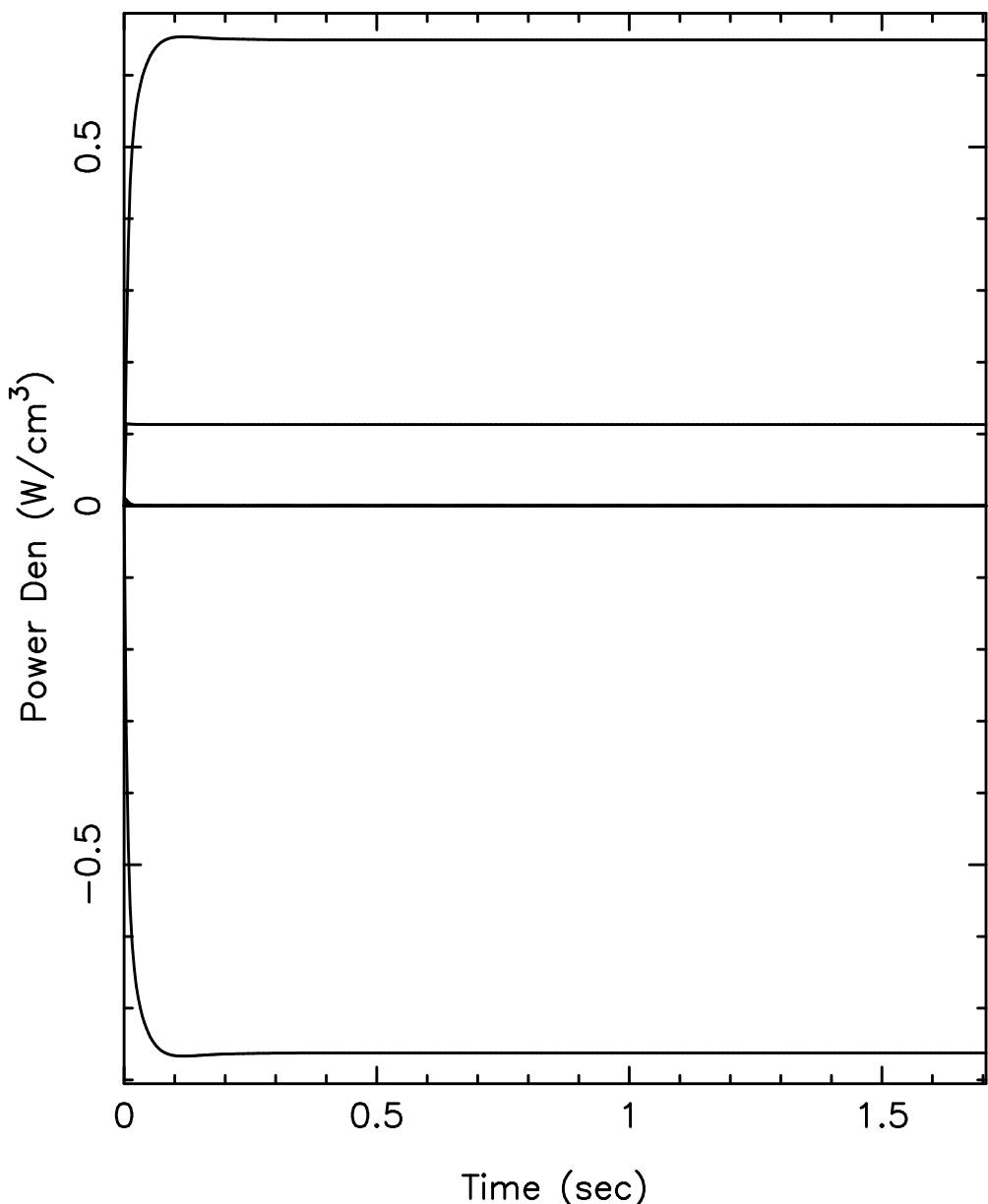


Particle source integrated over theta0 for species 1
(normed so int(0,1)*2pi*x**2*dx=mid-plane source)
vnorm= 3.6947E+10 cm/s

time step (n) is 200 time= 1.7060E+00 secs
r/a= 6.5510E-02 radial position (R) = 1.8200E+02 cm

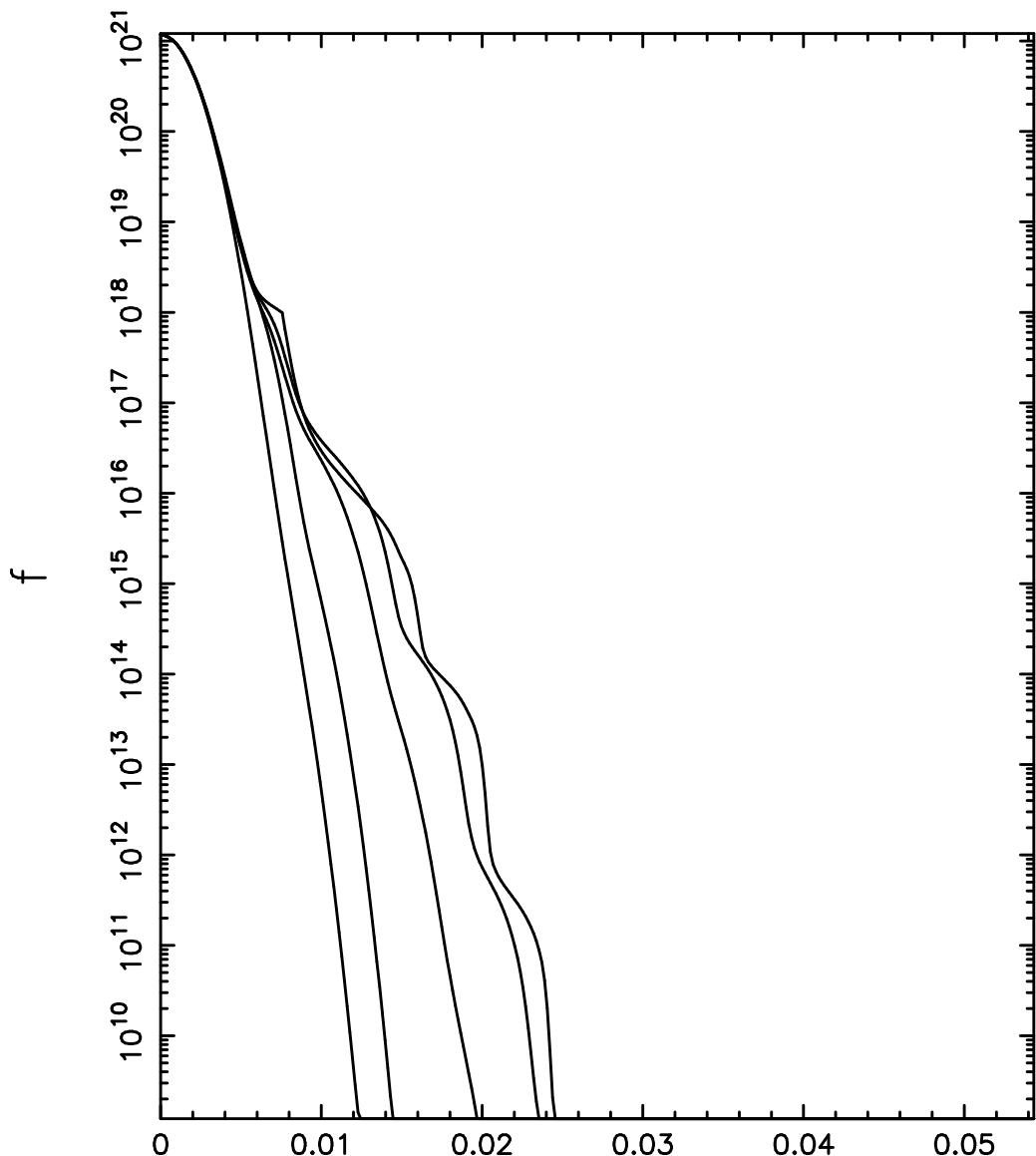


Species k= 1 Final powers in Watts/cc are:
 sum over all comp= 1.37E-01 From df/dt : 2.94E-06
 collisional transfer from Maxwellian elec.= -2.71E-01
 collisional transfer from Maxwellian ions= -4.45E-01
 collisional transfer from gens.= -2.56E-01
 ohmic drive= 0.00E+00
 RF drive= 1.02E-01
 particle sources= 1.01E+00
 loss-lossmode(k)= 3.20E-16 losses-torloss(k)= -1.12E-91
 losses due to runaway= 0.00E+00
 setting neg f to zero= 2.33E-60
 synchrotron rad losses= 0.00E+00
 phenomenological energy losses= 0.00E+00



Species k= 2 Final powers in Watts/cc are:
 sum over all comp= -1.40E-10 From df/dt : -3.35E-10
 collisional transfer from Maxwellian elec.= -7.62E-01
 collisional transfer from Maxwellian ions= 1.13E-01
 collisional transfer from gens.= 6.49E-01
 ohmic drive= 0.00E+00
 RF drive= 6.01E-05
 particle sources= 0.00E+00
 loss-lossmode(k)= 0.00E+00 losses-torloss(k)= -6.40E-92
 losses due to runaway= 0.00E+00
 setting neg f to zero= 0.00E+00
 synchrotron rad losses= 0.00E+00
 phenomenological energy losses= 0.00E+00

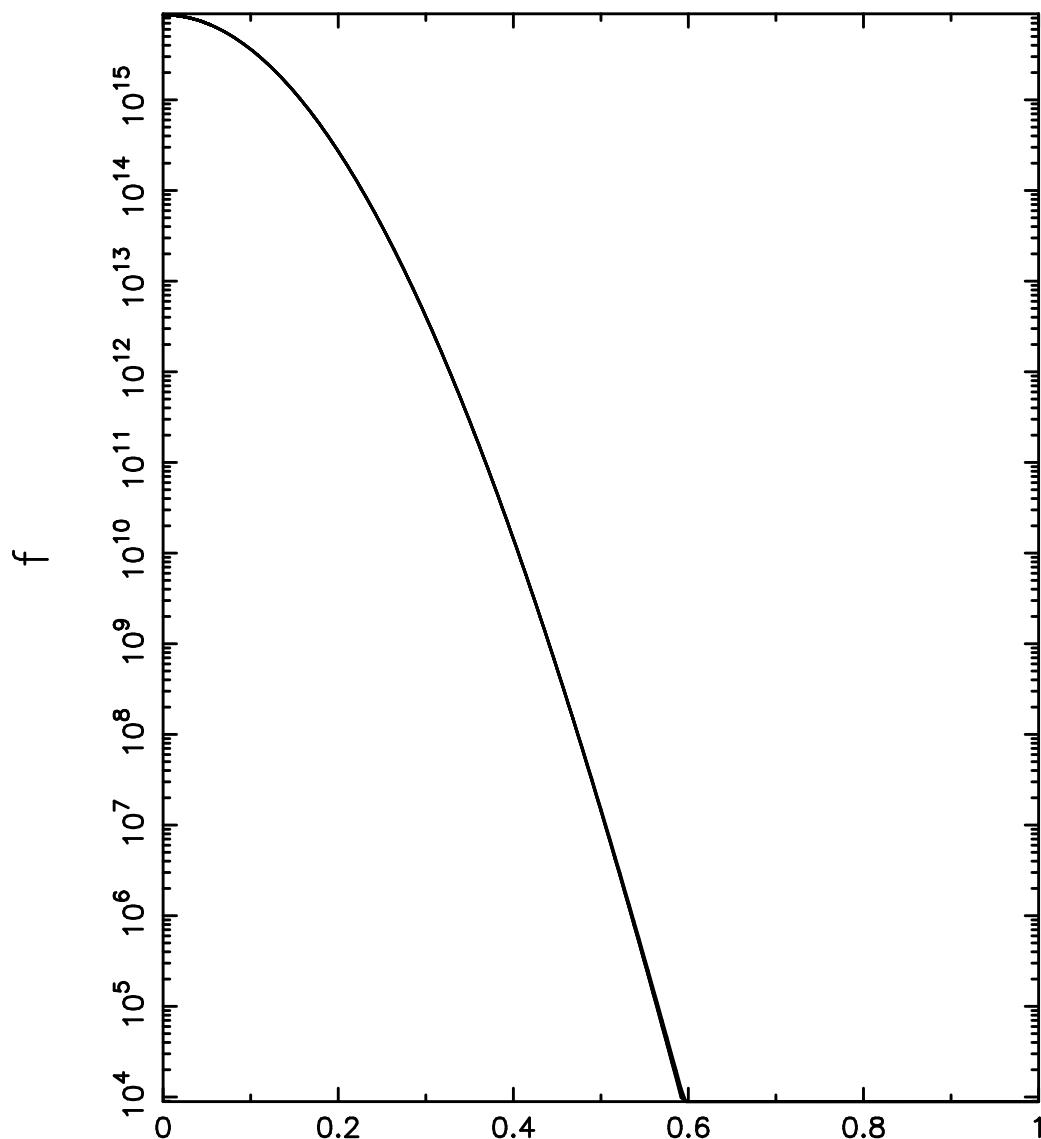
Cuts of f vs. v , at cnst pitch angle



u/v_{norm}

Distribution function vs. velocity for some angles
Species number=1, enorm= 3.00D+02
time step (n)= 200 time= 0.170600E+01 secs
 $r/a = 6.55E-02$ radial position(R)= 1.820E+02 cm

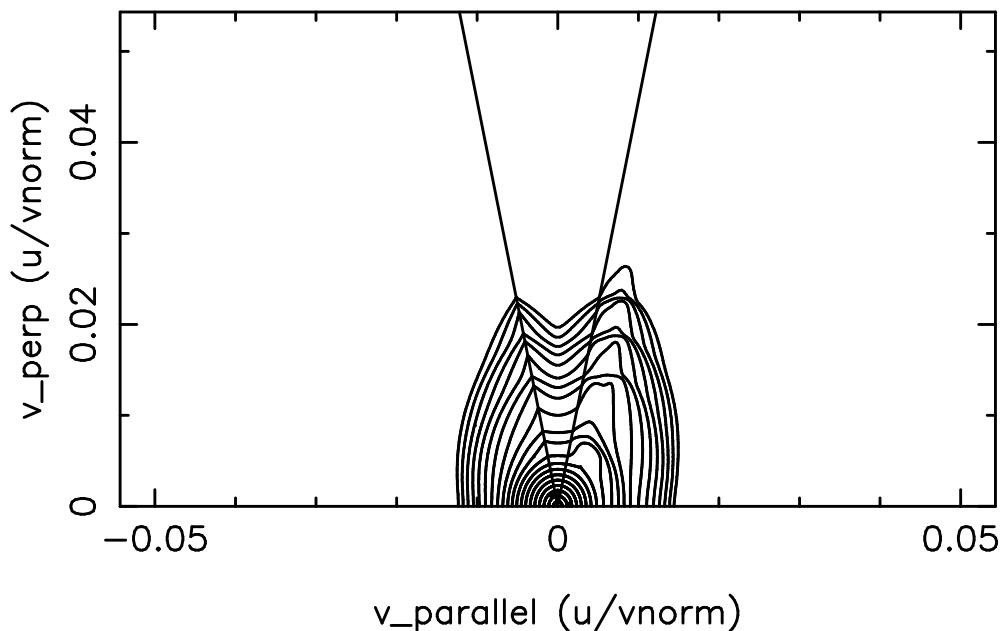
Cuts of f vs. v , at cnst pitch angle



u/v_{norm}

Distribution function vs. velocity for some angles
Species number=2, enorm= 3.00D+02
time step (n)= 200 time= 0.170600E+01 secs
r/a= 6.55E-02 radial position(R)= 1.820E+02 cm

Species 1 Distribution Function Contour Plot

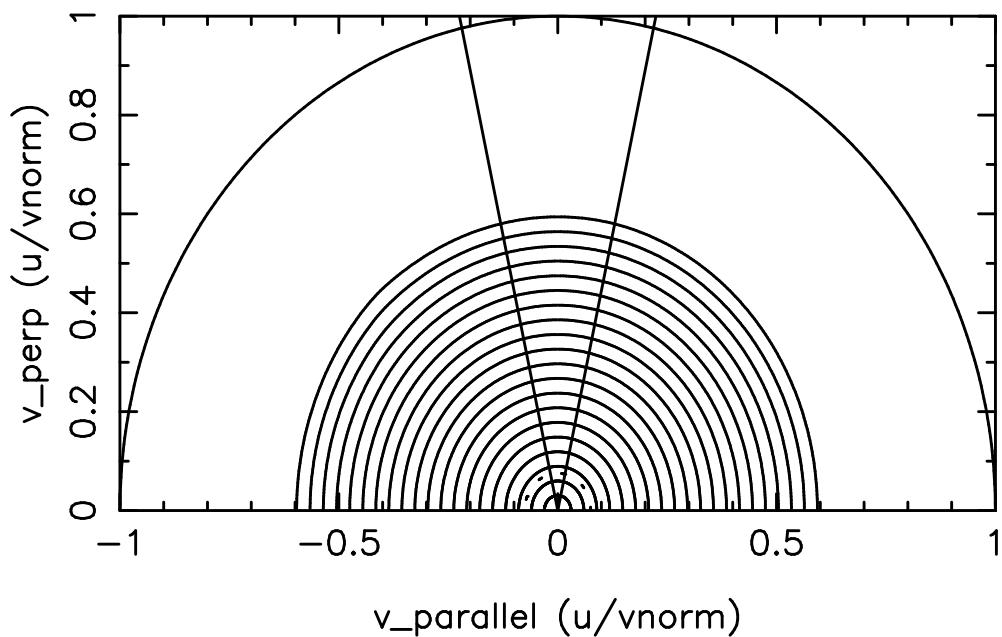


time step n= 200 time= 1.71E+00 secs
 $r/a = 6.551E-02$ radial position (R)= 1.8200E+02 cm
 $rya = 6.551E-02$ R=rpcon= 1.8200E+02 cm, Surf# 9

Contour values:

| | | | |
|--------------|--------------|--------------|--------------|
| 1.085659E+21 | 8.543362E+20 | 5.738783E+20 | 3.297592E+20 |
| 1.625654E+20 | 6.900588E+19 | 2.532861E+19 | 8.077352E+18 |
| 2.249604E+18 | 5.501826E+17 | 1.188371E+17 | 2.280227E+16 |
| 3.909701E+15 | 6.025558E+14 | 8.395609E+13 | 1.063566E+13 |
| 1.231728E+12 | 1.310985E+11 | 1.288873E+10 | 1.176104E+09 |

Species 2 Distribution Function Contour Plot



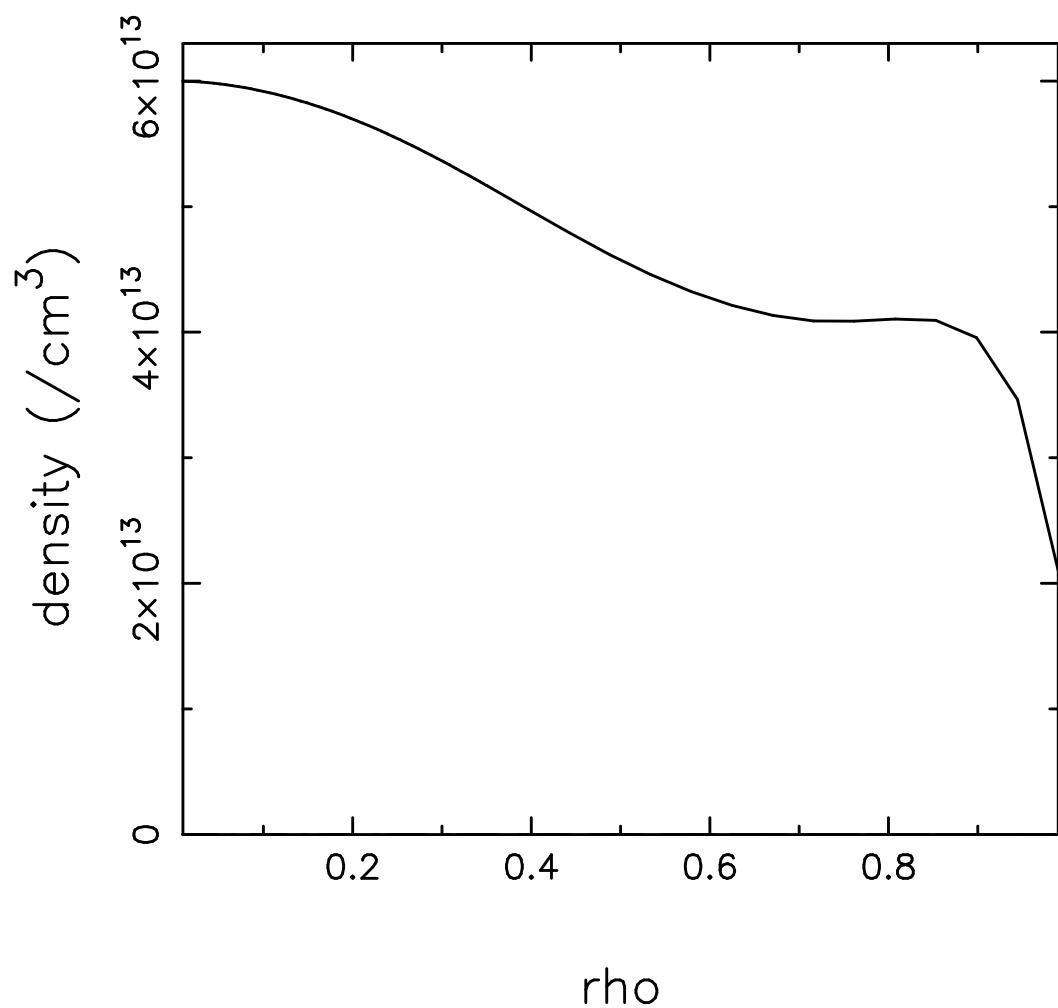
time step n= 200 time= 1.71E+00 secs
 $r/a = 6.551E-02$ radial position (R)= 1.8200E+02 cm
 $rya = 6.551E-02$ R=rpcon= 1.8200E+02 cm, Surf# 9

Contour values:

| | | | |
|--------------|--------------|--------------|--------------|
| 7.990082E+15 | 6.338563E+15 | 4.313539E+15 | 2.521951E+15 |
| 1.269407E+15 | 5.515118E+14 | 2.074603E+14 | 6.780489E+13 |
| 1.932912E+13 | 4.826138E+12 | 1.060089E+12 | 2.057971E+11 |
| 3.547697E+10 | 5.457007E+09 | 7.526037E+08 | 9.351483E+07 |
| 1.051899E+07 | 1.076192E+06 | 1.006059E+05 | 8.632092E+03 |

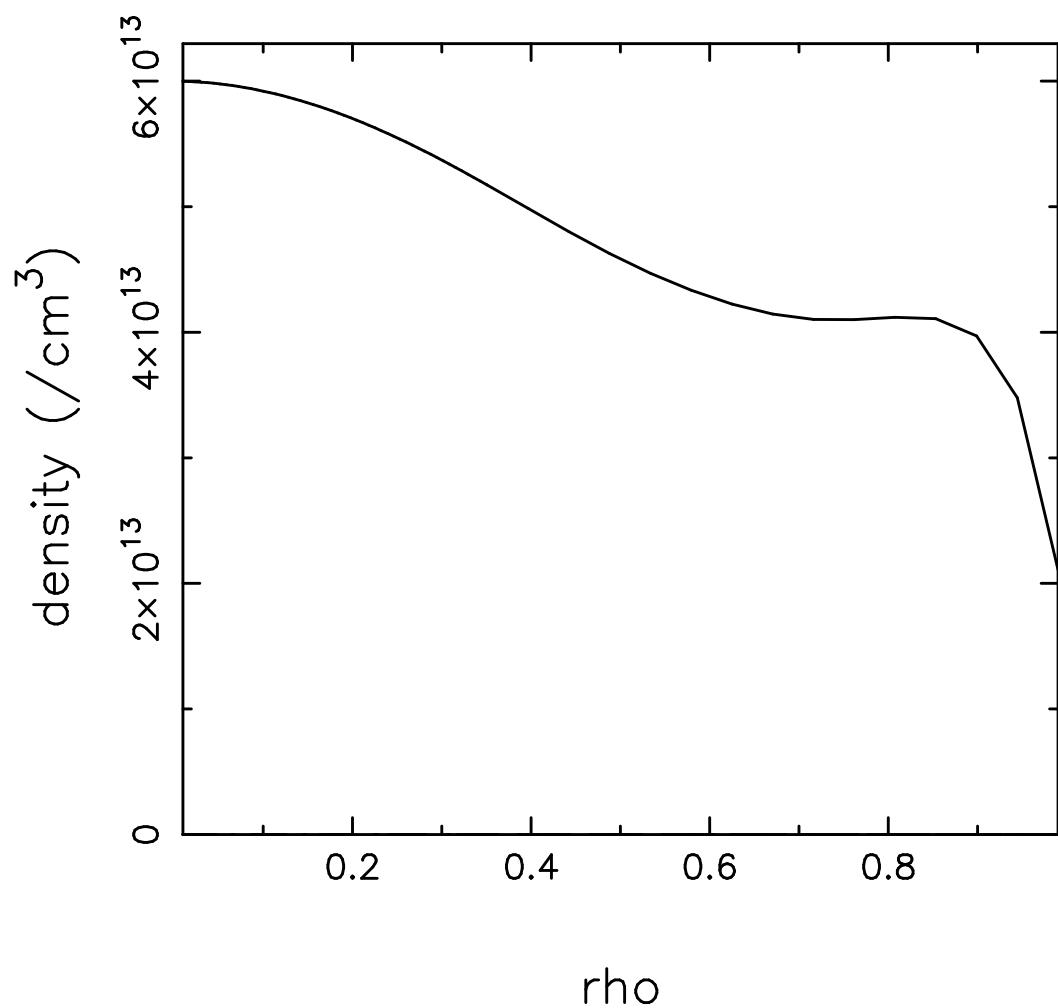
DENSITIES (/CC) OF SPECIES

species no. 1 D general time step n= 200



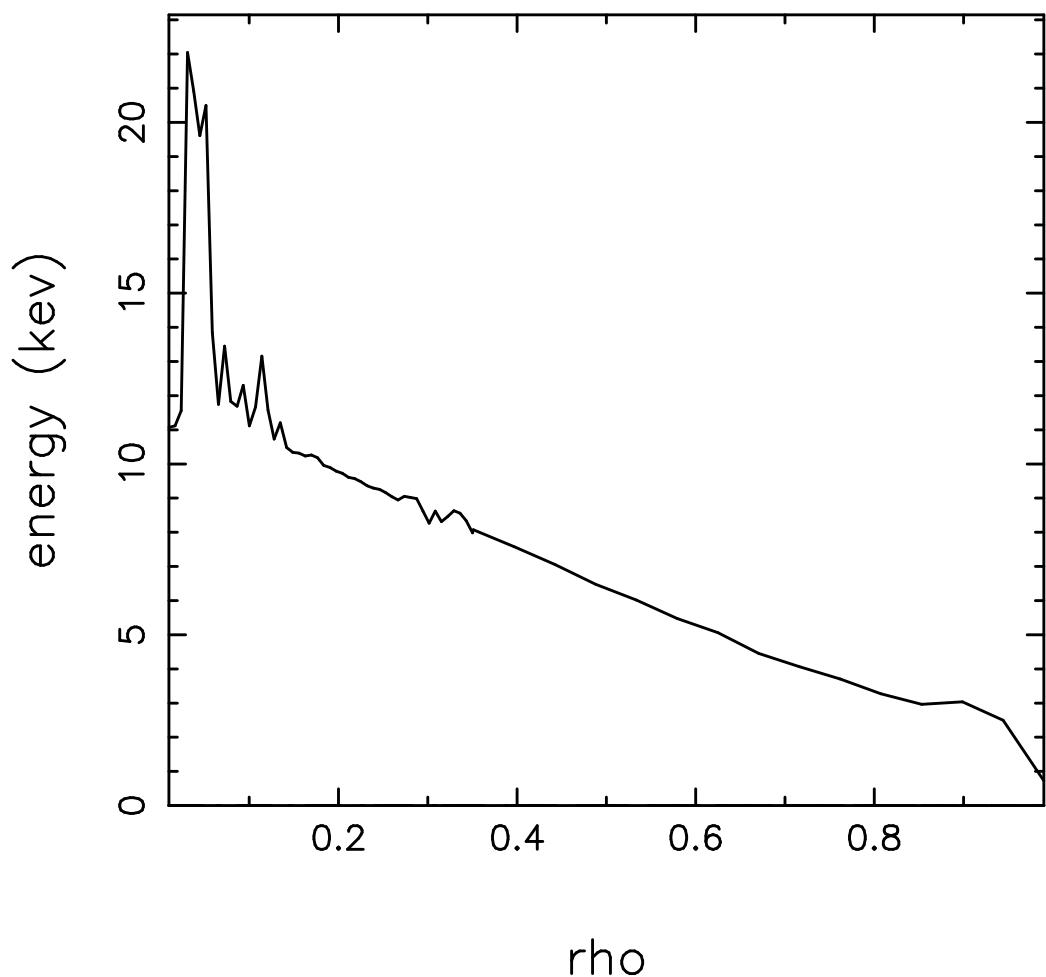
DENSITIES (/CC) OF SPECIES

species no. 2 e general time step n= 200



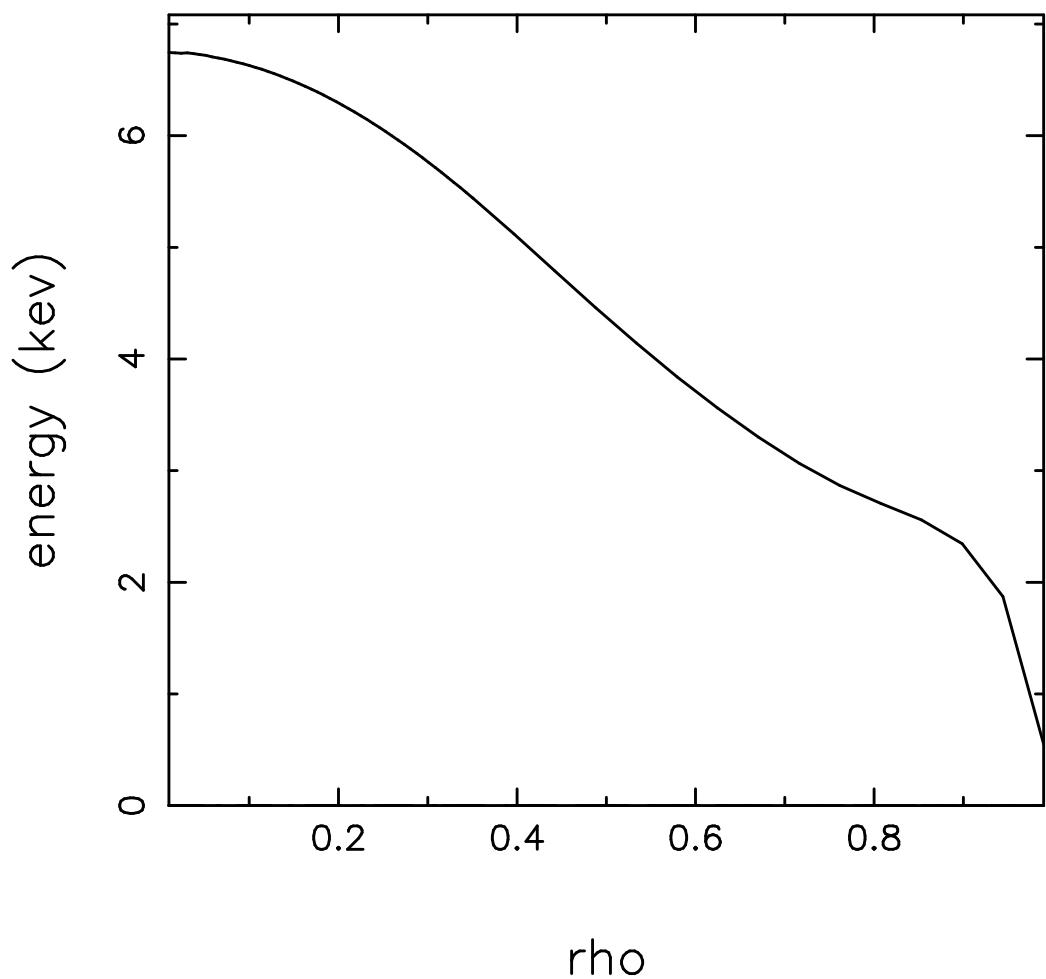
ENERGIES OF SPECIES IN KEV
(Solid: <..>_FSA)

species no. 1 D general time step n= 200



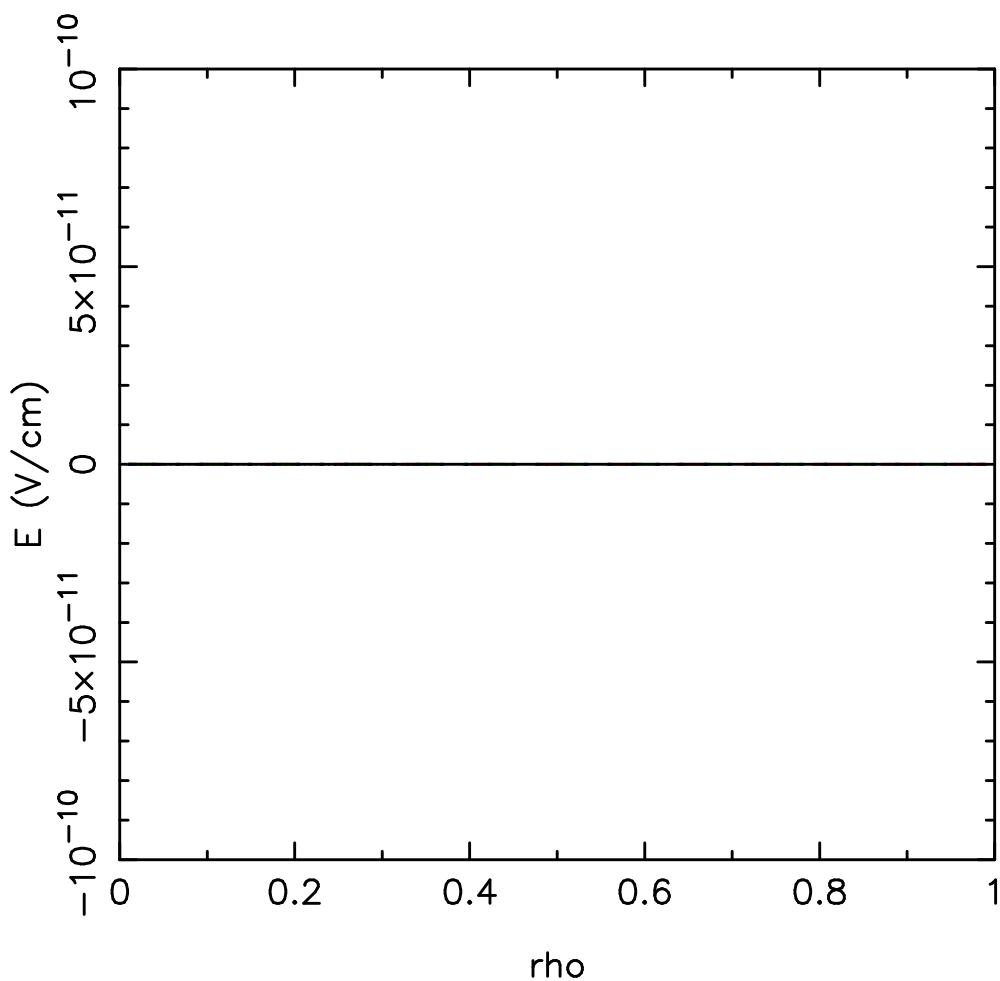
ENERGIES OF SPECIES IN KEV
(Solid: <..>_FSA)

species no. 2 e general time step n= 200



Electric field (V/cm)

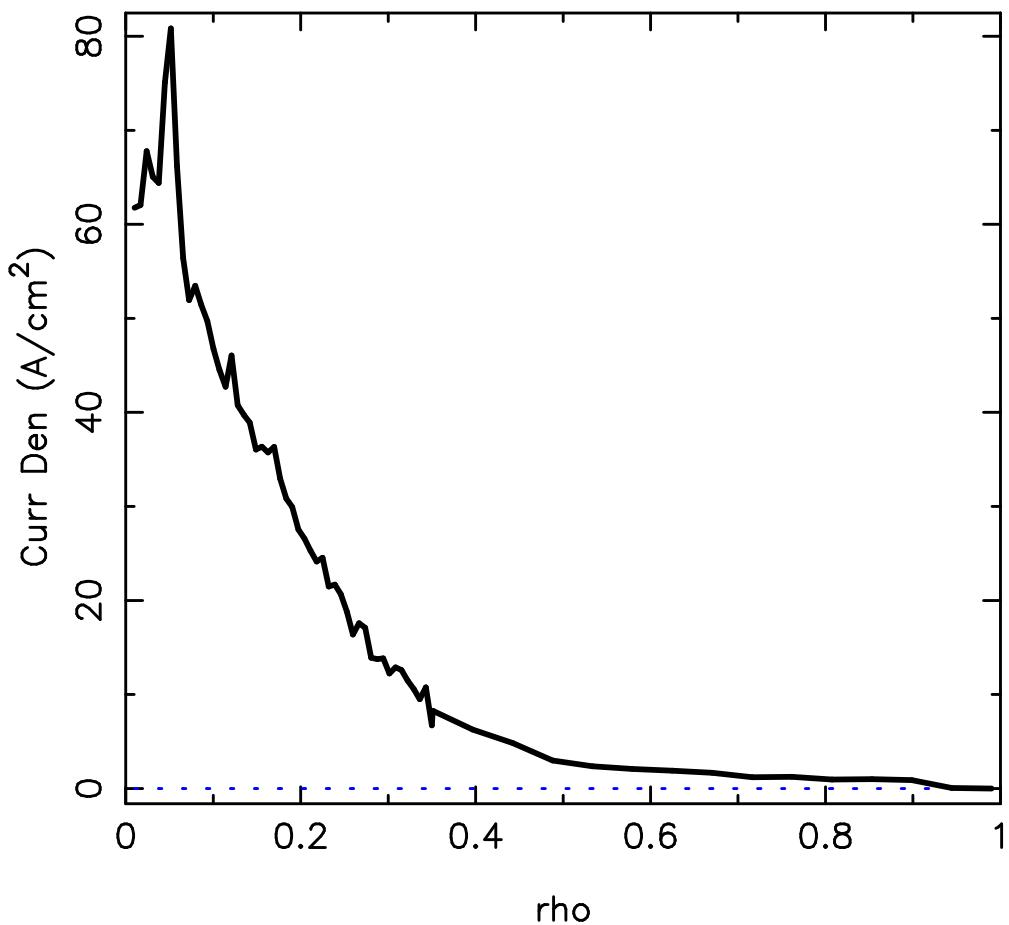
n= 1; t= 0.000000E+00sec
n= 67; t= 3.660000E-01sec
n= 133; t= 1.026000E+00sec
n= 200; t= 1.696000E+00sec



FLUX SURF. AV. CURNT. (AMPS/CM²)

Species: 1 Current from sum[curr*darea]= 9.048430E+04 A

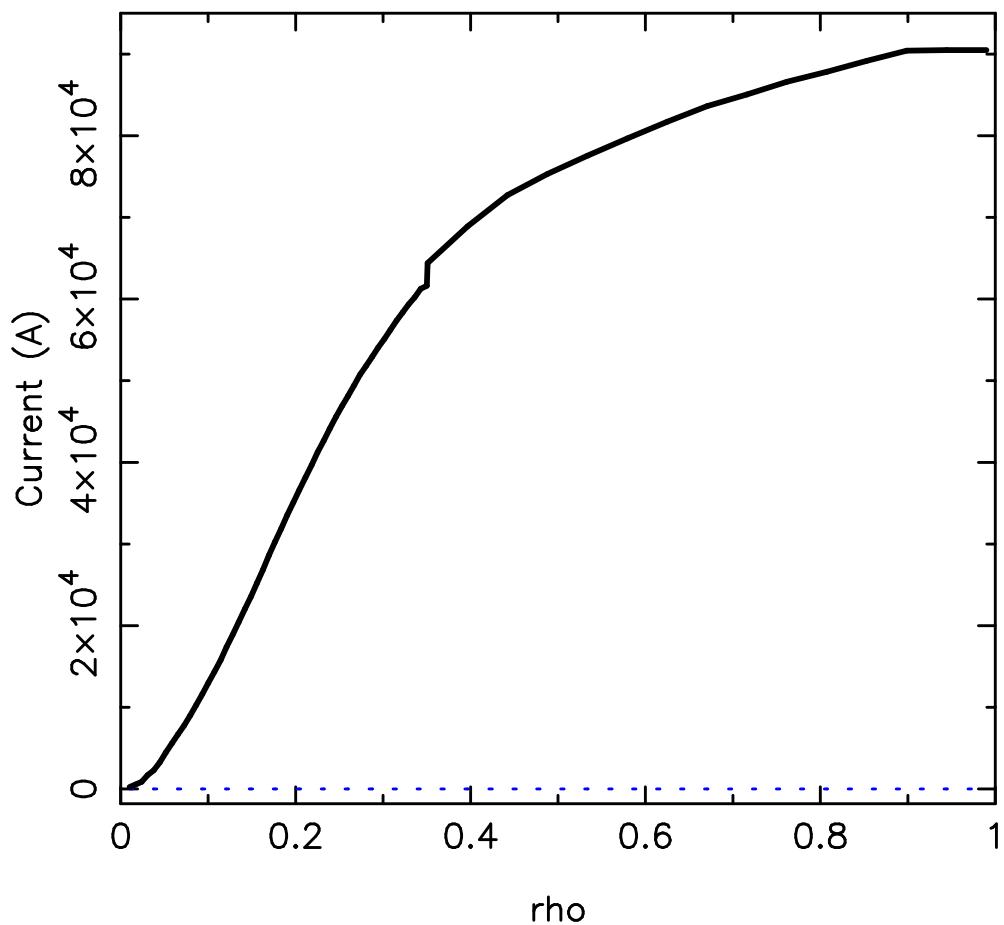
Blue/dotted: Bootstrap (fit model: bscurm() array) 0.000E+00A
Solid/thin: Integral over f (curr() array) 9.048E+04A
Solid/bold: All the above together 9.048E+04A



Current (A) INTEGRATED UP TO RHO or PSI

Species: 1 Current from sum[curr*darea]= 9.048430E+04 A

Blue/dotted: Bootstrap (fit model: bscurm() array) 0.000E+00A
Solid/thin: From Integral over f (curr()) 9.048E+04A
Solid/bold: From All the above together 9.048E+04A



FLUX SURF. AV. CURNT. (AMPS/CM²)

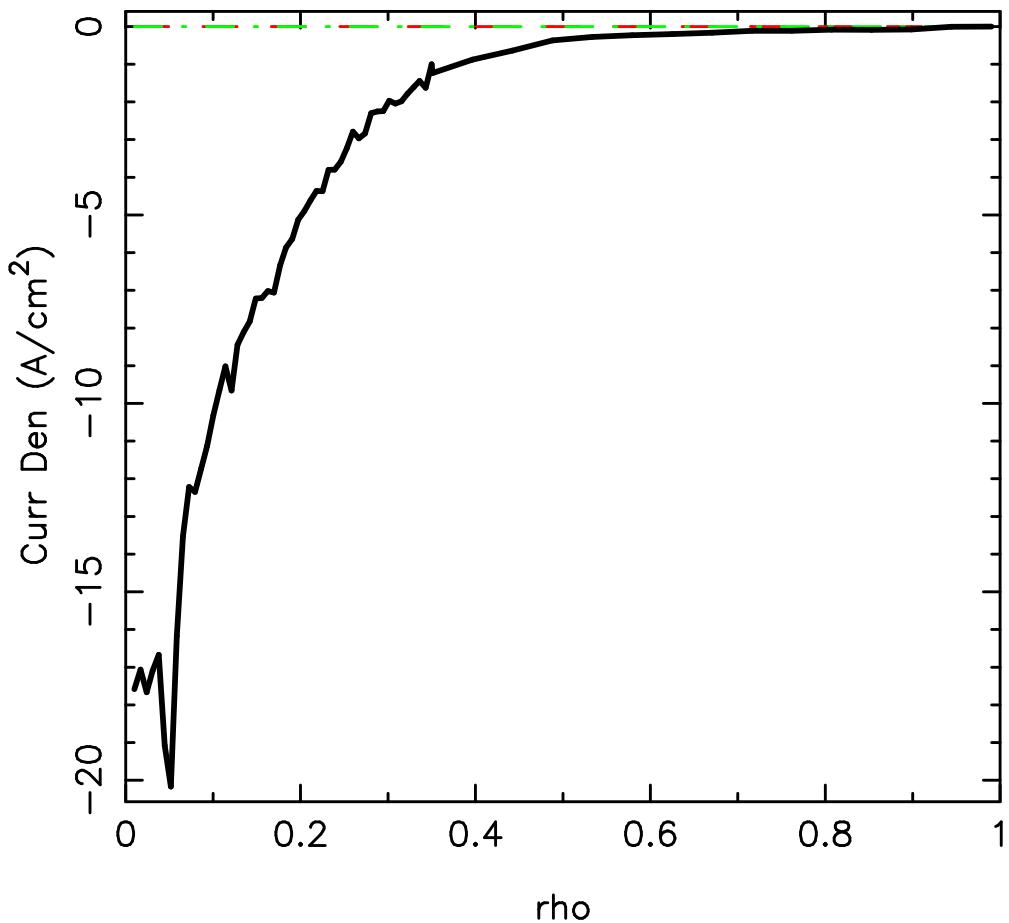
Species: 2 Current from sum[curr*darea]= -1.538902E+04 A

Red-- (sigma_coll_neo-sigma_banana)*Ephi 0.000E+00A

Green-- Bootstrap (fit model: bscurm()) 0.000E+00A

Solid/thin: Integral over f (curr() array) -1.539E+04A

Solid/bold: All the above together -1.539E+04A



Current (A) INTEGRATED UP TO RHO or PSI

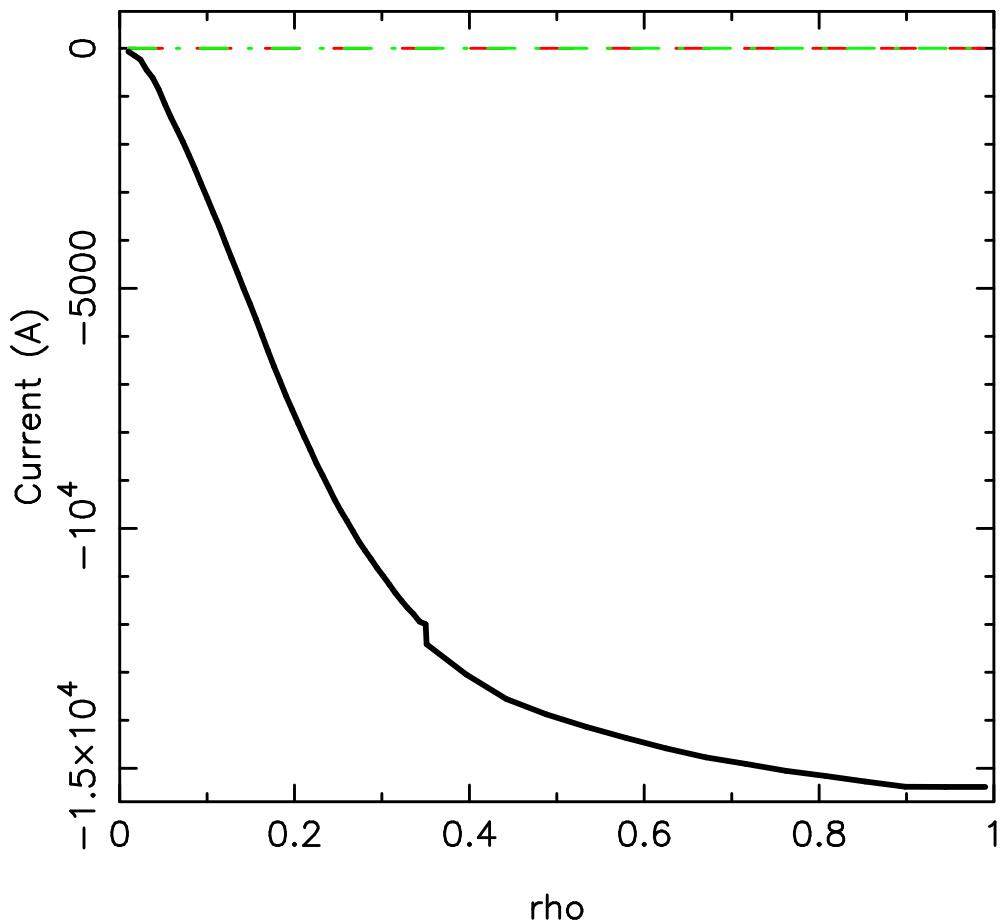
Species: 2 Current from sum[curr*darea]= -1.538902E+04 A

Red-- (sigma_coll_neo-sigma_banana)*Ephi 0.000E+00A

Green-- Bootstrap (fit model: bscurm()) 0.000E+00A

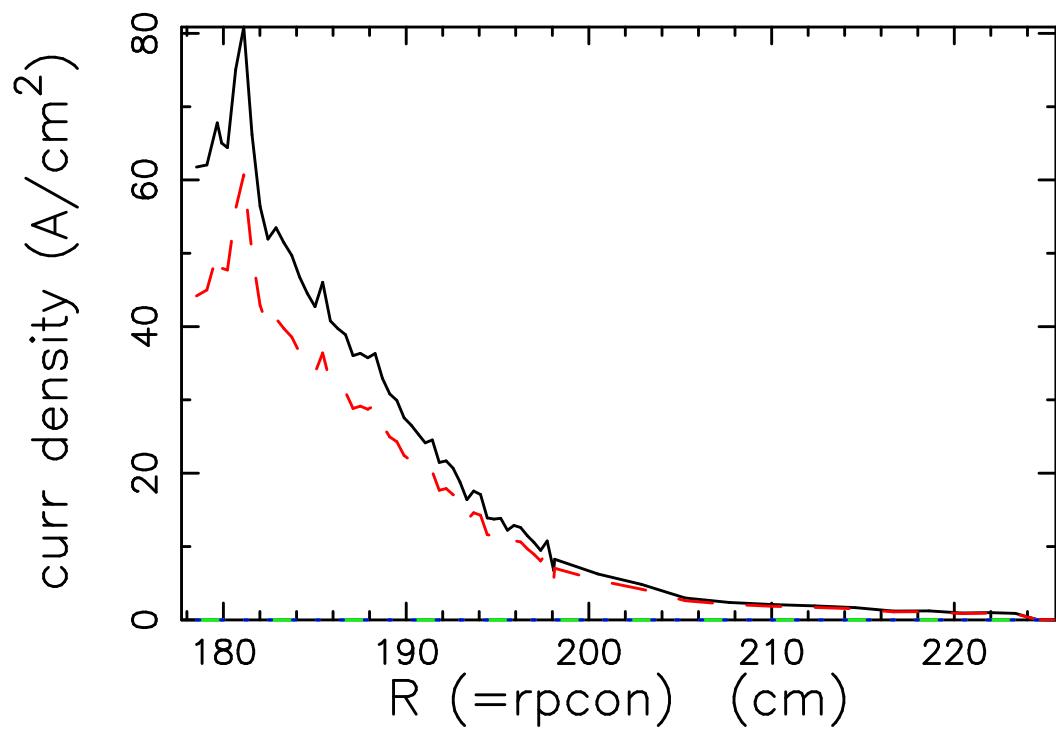
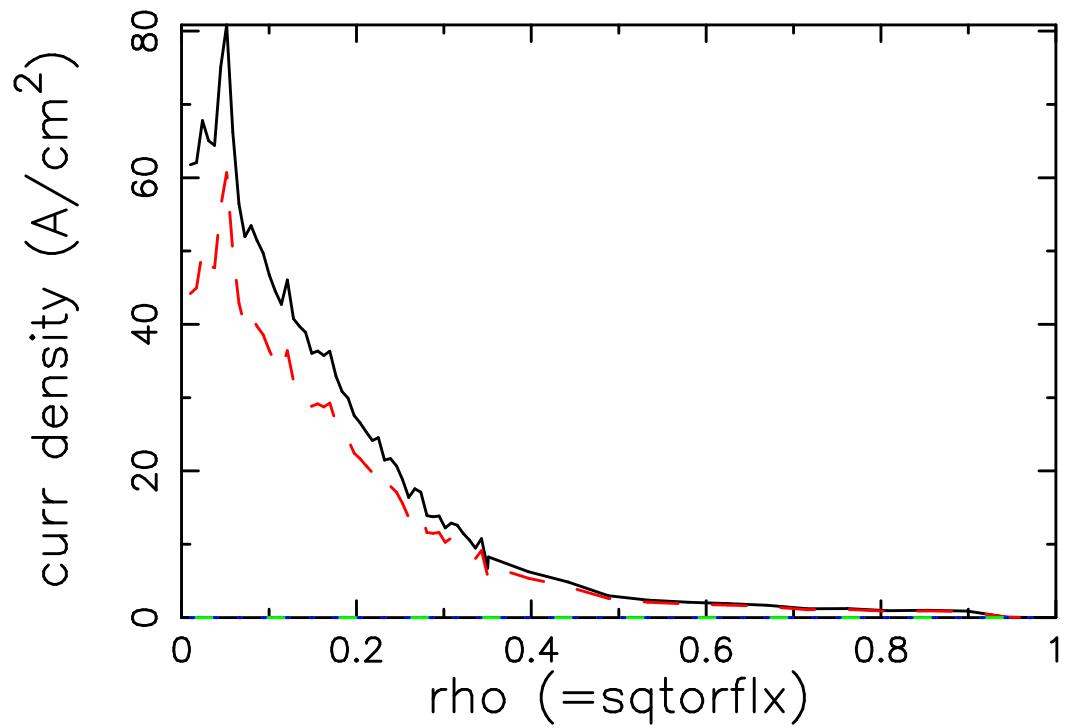
Solid/thin: From Integral over f (curr()) -1.539E+04A

Solid/bold: From All the above together -1.539E+04A



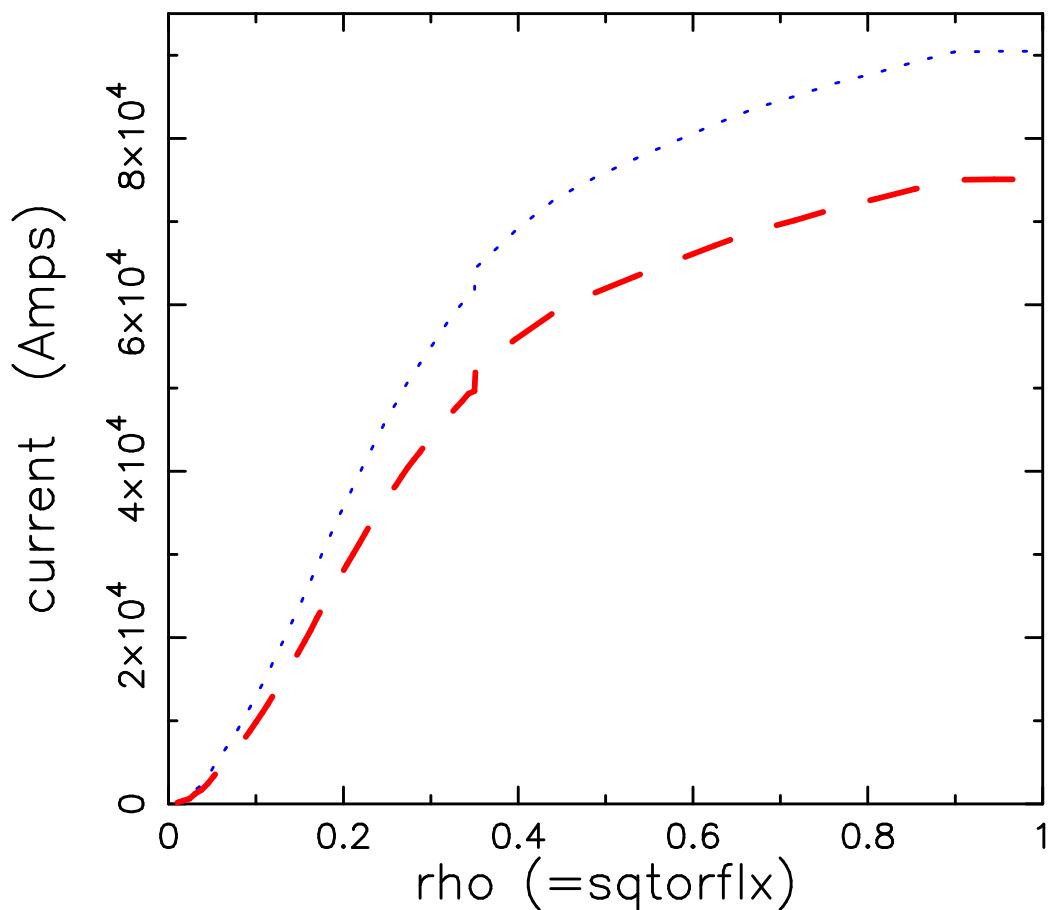
CURRENT (AMPS/CM²)

fi [solid]= 9.048E+04 fi+e[---]= 7.510E+04
bs_e[---]= 0.000E+00 bs_i[.....]= 0.000E+00 Amps



CURRENT (AMPS)
(INTEGRATED UP TO RHO or PSI)

Blue/dotted: using currz(k,lr) over ionic general species
Red/dashed: using curr(k,lr) over all general species



SOURCE POWER: (WATTS/CC)

| rho | NBI(orKO)+RF | NBI(or KO) | RF(1) | RF(2) | RF(3) |
|-----------|--------------|-------------|----------------------------------|-----------|-----------|
| rho | (sorpwt) | (sorpw_nbi) | (sorpw_rf for gen.species 1,2,3) | | |
| 1.000E-02 | 1.038E+00 | 1.038E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.694E-02 | 1.051E+00 | 1.051E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.388E-02 | 1.146E+00 | 1.146E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.082E-02 | 3.043E+00 | 1.121E+00 | 1.922E+00 | 9.595E-06 | |
| 3.776E-02 | 2.415E+00 | 1.077E+00 | 1.338E+00 | 6.045E-05 | |
| 4.469E-02 | 2.217E+00 | 1.051E+00 | 1.166E+00 | 4.656E-05 | |
| 5.163E-02 | 2.284E+00 | 1.024E+00 | 1.260E+00 | 6.700E-05 | |
| 5.857E-02 | 1.414E+00 | 1.043E+00 | 3.712E-01 | 7.025E-05 | |
| 6.551E-02 | 1.110E+00 | 1.008E+00 | 1.021E-01 | 6.007E-05 | |
| 7.245E-02 | 1.360E+00 | 9.839E-01 | 3.762E-01 | 3.425E-04 | |
| 7.939E-02 | 1.122E+00 | 9.975E-01 | 1.241E-01 | 3.395E-04 | |
| 8.633E-02 | 1.082E+00 | 9.639E-01 | 1.180E-01 | 3.029E-04 | |
| 9.327E-02 | 1.197E+00 | 9.710E-01 | 2.256E-01 | 8.931E-04 | |
| 1.002E-01 | 9.883E-01 | 9.335E-01 | 5.411E-02 | 6.691E-04 | |
| 1.071E-01 | 1.033E+00 | 8.840E-01 | 1.484E-01 | 6.564E-04 | |
| 1.141E-01 | 1.276E+00 | 8.841E-01 | 3.885E-01 | 3.204E-03 | |
| 1.210E-01 | 1.048E+00 | 9.259E-01 | 1.201E-01 | 2.291E-03 | |
| 1.280E-01 | 8.947E-01 | 8.558E-01 | 3.717E-02 | 1.684E-03 | |
| 1.349E-01 | 9.553E-01 | 8.535E-01 | 9.959E-02 | 2.245E-03 | |
| 1.418E-01 | 8.472E-01 | 8.369E-01 | 8.640E-03 | 1.674E-03 | |
| 1.488E-01 | 8.177E-01 | 8.134E-01 | 3.062E-03 | 1.241E-03 | |
| 1.557E-01 | 8.114E-01 | 8.102E-01 | 1.906E-04 | 9.477E-04 | |
| 1.627E-01 | 7.926E-01 | 7.918E-01 | 3.508E-06 | 7.597E-04 | |
| 1.696E-01 | 7.980E-01 | 7.974E-01 | 2.997E-08 | 6.183E-04 | |
| 1.765E-01 | 7.835E-01 | 7.830E-01 | 9.632E-11 | 5.086E-04 | |
| 1.835E-01 | 7.266E-01 | 7.262E-01 | 1.072E-12 | 4.229E-04 | |
| 1.904E-01 | 7.149E-01 | 7.145E-01 | 2.158E-13 | 3.551E-04 | |
| 1.973E-01 | 6.901E-01 | 6.898E-01 | 5.776E-14 | 2.995E-04 | |
| 2.043E-01 | 6.769E-01 | 6.766E-01 | 1.687E-14 | 2.544E-04 | |
| 2.112E-01 | 6.518E-01 | 6.516E-01 | 2.502E-14 | 2.165E-04 | |
| 2.182E-01 | 6.442E-01 | 6.440E-01 | 1.706E-13 | 1.848E-04 | |
| 2.251E-01 | 6.231E-01 | 6.229E-01 | 1.177E-12 | 1.598E-04 | |
| 2.320E-01 | 6.003E-01 | 6.002E-01 | 7.585E-12 | 1.377E-04 | |
| 2.390E-01 | 5.882E-01 | 5.881E-01 | 4.399E-10 | 1.202E-04 | |
| 2.459E-01 | 5.824E-01 | 5.823E-01 | 5.260E-08 | 1.029E-04 | |
| 2.529E-01 | 5.647E-01 | 5.646E-01 | 3.113E-06 | 9.126E-05 | |
| 2.598E-01 | 5.441E-01 | 5.439E-01 | 8.069E-05 | 8.060E-05 | |
| 2.667E-01 | 5.266E-01 | 5.257E-01 | 8.276E-04 | 6.933E-05 | |
| 2.737E-01 | 5.511E-01 | 5.447E-01 | 6.337E-03 | 5.964E-05 | |
| 2.806E-01 | 5.386E-01 | 5.151E-01 | 2.345E-02 | 5.570E-05 | |

| | | | | |
|-----------|-----------|-----------|-----------|-----------|
| 2.876E-01 | 5.292E-01 | 4.871E-01 | 4.209E-02 | 4.899E-05 |
| 2.945E-01 | 1.603E+00 | 4.892E-01 | 1.114E+00 | 4.495E-05 |
| 3.014E-01 | 1.494E+00 | 4.957E-01 | 9.984E-01 | 5.445E-05 |
| 3.084E-01 | 1.380E+00 | 4.959E-01 | 8.840E-01 | 7.547E-05 |
| 3.153E-01 | 1.357E+00 | 4.647E-01 | 8.921E-01 | 1.048E-04 |
| 3.222E-01 | 1.187E+00 | 4.666E-01 | 7.202E-01 | 1.486E-04 |
| 3.292E-01 | 5.405E-01 | 4.329E-01 | 1.074E-01 | 1.829E-04 |
| 3.361E-01 | 5.081E-01 | 4.585E-01 | 4.947E-02 | 1.688E-04 |
| 3.431E-01 | 4.637E-01 | 4.473E-01 | 1.624E-02 | 1.511E-04 |
| 3.500E-01 | 3.940E-01 | 3.904E-01 | 3.481E-03 | 1.377E-04 |
| 3.510E-01 | 4.170E-01 | 4.165E-01 | 3.634E-04 | 1.237E-04 |
| 3.966E-01 | 3.734E-01 | 3.733E-01 | 1.053E-06 | 6.616E-05 |
| 4.423E-01 | 3.286E-01 | 3.285E-01 | 1.391E-06 | 3.484E-05 |
| 4.879E-01 | 2.743E-01 | 2.743E-01 | 3.699E-06 | 1.910E-05 |
| 5.336E-01 | 2.498E-01 | 2.498E-01 | 1.960E-05 | 1.088E-05 |
| 5.792E-01 | 2.550E-01 | 2.282E-01 | 2.672E-02 | 6.635E-06 |
| 6.249E-01 | 2.075E-01 | 2.074E-01 | 4.919E-05 | 4.458E-06 |
| 6.705E-01 | 1.291E-01 | 1.291E-01 | 5.290E-11 | 3.115E-06 |
| 7.161E-01 | 9.255E-02 | 9.255E-02 | 4.239E-12 | 2.164E-06 |
| 7.618E-01 | 4.980E-02 | 4.980E-02 | 2.720E-13 | 1.490E-06 |
| 8.074E-01 | 1.692E-02 | 1.692E-02 | 3.474E-21 | 1.324E-06 |
| 8.531E-01 | 1.820E-02 | 1.819E-02 | 3.054E-08 | 1.303E-06 |
| 8.987E-01 | 1.800E-02 | 1.794E-02 | 6.601E-05 | 9.487E-07 |
| 9.444E-01 | 3.221E-03 | 3.221E-03 | 7.073E-10 | 1.598E-07 |
| 9.900E-01 | 1.204E-18 | 0.000E+00 | 1.164E-18 | 3.951E-20 |

Power integr.over rad. (RF+NBI(or KO), all gen.species)= 4.4778E+06Watts
 Power from NBI(or KO) (sorpw_nbii)= 3.8507E+06Watts
 Power from RF (sorpw_rfi) Gen.species no.1 = 6.2586E+05Watts
 Power from RF (sorpw_rfi) Gen.species no.2 = 1.2149E+03Watts

DEPOSITED POWER: (WATTS/CC)

| rho | TOTAL | RF1 | RF2 | RF3 | RF4 | RF5 |
|-------|----------|---|------------|-----------|----------|-----------|
| rho | (powrft) | (powrf(*,harmonic) for harmonics = 1-5) | | | | |
| 0.010 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.017 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.024 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.031 | 0.18E+01 | 0.00E+00 | 0.00E+00 | 0.97E-63 | 0.18E+01 | 0.34E-63 |
| 0.038 | 0.13E+01 | 0.00E+00 | 0.00E+00 | 0.11E-70 | 0.13E+01 | 0.94E-72 |
| 0.045 | 0.12E+01 | 0.00E+00 | 0.00E+00 | 0.53E-85 | 0.12E+01 | 0.18E-105 |
| 0.052 | 0.13E+01 | 0.00E+00 | 0.00E+00 | 0.16E-68 | 0.13E+01 | 0.41E-70 |
| 0.059 | 0.37E+00 | 0.00E+00 | 0.00E+00 | 0.53E-72 | 0.37E+00 | 0.52E-76 |
| 0.066 | 0.10E+00 | 0.00E+00 | 0.00E+00 | 0.56E-71 | 0.10E+00 | 0.33E-80 |
| 0.072 | 0.37E+00 | 0.37E-115 | 0.11E-90 | 0.50E-49 | 0.37E+00 | -0.33E-48 |
| 0.079 | 0.12E+00 | 0.19E-124 | 0.74E-102 | 0.13E-56 | 0.12E+00 | -0.55E-58 |
| 0.086 | 0.12E+00 | 0.42E-131 | 0.92E-105 | 0.32E-46 | 0.12E+00 | 0.41E-37 |
| 0.093 | 0.22E+00 | 0.91E-119 | 0.20E-103 | 0.66E-39 | 0.22E+00 | 0.23E-27 |
| 0.100 | 0.55E-01 | 0.13E-135 | 0.16E-110 | 0.22E-49 | 0.54E-01 | 0.35E-23 |
| 0.107 | 0.15E+00 | 0.52E-131 | 0.28E-111 | 0.26E-34 | 0.15E+00 | 0.80E-20 |
| 0.114 | 0.39E+00 | 0.44E-114 | 0.20E-101 | 0.21E-30 | 0.38E+00 | 0.32E-15 |
| 0.121 | 0.12E+00 | 0.18E-113 | 0.54E-106 | 0.12E-41 | 0.12E+00 | 0.00E+00 |
| 0.128 | 0.39E-01 | 0.32E-110 | 0.12E-99 | 0.30E-34 | 0.37E-01 | -0.17E-15 |
| 0.135 | 0.10E+00 | 0.20E-104 | 0.17E-96 | 0.83E-25 | 0.99E-01 | 0.80E-14 |
| 0.142 | 0.10E-01 | 0.18E-112 | 0.61E-104 | 0.84E-36 | 0.87E-02 | 0.33E-14 |
| 0.149 | 0.43E-02 | 0.12E-116 | 0.30E-107 | 0.11E-34 | 0.31E-02 | 0.52E-14 |
| 0.156 | 0.11E-02 | 0.48E-118 | 0.28E-108 | 0.86E-35 | 0.19E-03 | 0.64E-15 |
| 0.163 | 0.77E-03 | 0.11E-117 | 0.25E-107 | 0.15E-35 | 0.36E-05 | 0.96E-17 |
| 0.170 | 0.62E-03 | 0.14E-117 | 0.57E-106 | 0.56E-37 | 0.31E-07 | 0.42E-18 |
| 0.177 | 0.51E-03 | 0.43E-119 | 0.16E-104 | -0.22E-40 | 0.99E-10 | 0.92E-19 |
| 0.183 | 0.42E-03 | 0.00E+00 | 0.14E-107 | -0.30E-46 | 0.11E-11 | 0.90E-18 |
| 0.190 | 0.36E-03 | 0.00E+00 | 0.00E+00 | 0.22E-99 | 0.22E-12 | 0.17E-16 |
| 0.197 | 0.30E-03 | 0.00E+00 | 0.00E+00 | 0.36E-27 | 0.59E-13 | 0.22E-15 |
| 0.204 | 0.26E-03 | 0.79E-109 | 0.19E-97 | 0.36E-23 | 0.15E-13 | 0.26E-14 |
| 0.211 | 0.22E-03 | 0.30E-106 | 0.16E-95 | 0.48E-20 | 0.33E-14 | 0.22E-13 |
| 0.218 | 0.19E-03 | 0.13E-105 | 0.29E-95 | 0.62E-17 | 0.91E-15 | 0.17E-12 |
| 0.225 | 0.16E-03 | 0.22E-104 | 0.79E-94 | 0.41E-14 | 0.21E-15 | 0.12E-11 |
| 0.232 | 0.14E-03 | 0.90E-103 | 0.28E-92 | 0.19E-11 | 0.12E-15 | 0.58E-11 |
| 0.239 | 0.12E-03 | 0.53E-102 | 0.28E-91 | 0.42E-09 | 0.30E-14 | 0.30E-10 |
| 0.246 | 0.10E-03 | 0.28E-100 | 0.67E-90 | 0.54E-07 | 0.12E-12 | 0.13E-09 |
| 0.253 | 0.95E-04 | 0.99E-100 | 0.84E-90 | 0.32E-05 | 0.44E-11 | 0.47E-09 |
| 0.260 | 0.16E-03 | 0.34E-99 | 0.12E-89 | 0.82E-04 | 0.69E-10 | 0.16E-08 |
| 0.267 | 0.90E-03 | 0.28E-98 | 0.76E-89 | 0.83E-03 | 0.40E-09 | 0.77E-08 |
| 0.274 | 0.64E-02 | 0.20E-110 | -0.98E-100 | 0.64E-02 | 0.13E-08 | 0.35E-07 |
| 0.281 | 0.24E-01 | 0.21E-128 | -0.34E-98 | 0.23E-01 | 0.16E-08 | 0.23E-06 |

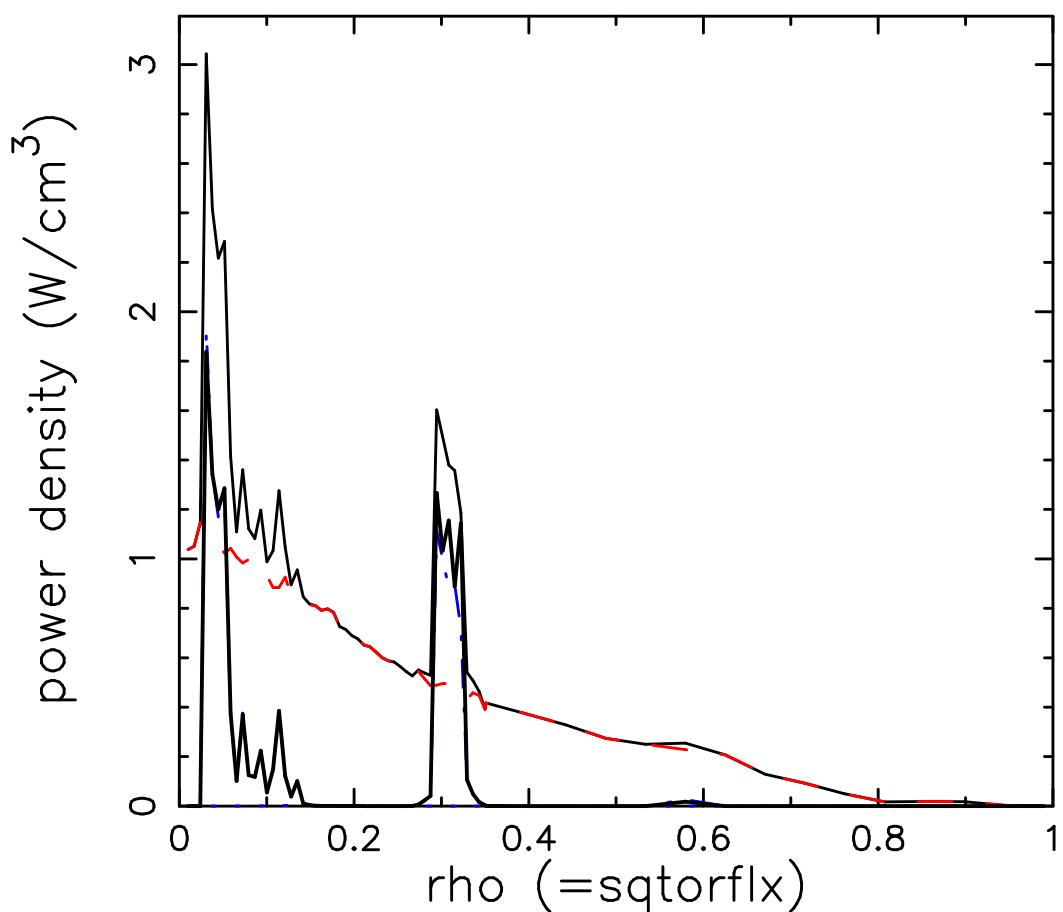
| | | | | | | |
|-------|----------|-----------|-----------|-----------|-----------|----------|
| 0.288 | 0.41E-01 | 0.17-148 | 0.24-117 | 0.41E-01 | 0.81E-09 | 0.13E-05 |
| 0.294 | 0.13E+01 | 0.00E+00 | 0.44E-39 | 0.13E+01 | 0.57E-09 | 0.40E-05 |
| 0.301 | 0.10E+01 | 0.24E-56 | 0.14E-39 | 0.10E+01 | 0.12E-09 | 0.46E-05 |
| 0.308 | 0.12E+01 | 0.23E-89 | 0.52E-73 | 0.12E+01 | 0.13E-09 | 0.12E-04 |
| 0.315 | 0.89E+00 | 0.44E-80 | 0.69E-64 | 0.89E+00 | 0.55E-10 | 0.70E-05 |
| 0.322 | 0.11E+01 | 0.71E-80 | 0.25E-63 | 0.11E+01 | 0.43E-10 | 0.63E-05 |
| 0.329 | 0.11E+00 | 0.42E-85 | -0.26E-64 | 0.11E+00 | 0.19E-11 | 0.74E-05 |
| 0.336 | 0.49E-01 | 0.13E-84 | -0.29E-62 | 0.49E-01 | 0.50E-11 | 0.51E-05 |
| 0.343 | 0.16E-01 | 0.30E-91 | -0.53E-62 | 0.16E-01 | 0.12E-11 | 0.28E-05 |
| 0.350 | 0.36E-02 | 0.16-114 | 0.10E-61 | 0.35E-02 | 0.43E-13 | 0.18E-05 |
| 0.351 | 0.49E-03 | 0.29E-90 | -0.10E-57 | 0.36E-03 | 0.48E-16 | 0.18E-05 |
| 0.397 | 0.67E-04 | 0.00E+00 | 0.81E-57 | 0.14E-08 | 0.48E-28 | 0.11E-05 |
| 0.442 | 0.36E-04 | 0.00E+00 | 0.00E+00 | 0.38E-34 | 0.96E-33 | 0.14E-05 |
| 0.488 | 0.23E-04 | 0.28-194 | 0.12E-17 | -0.26E-54 | 0.12E-30 | 0.37E-05 |
| 0.534 | 0.31E-04 | 0.67-170 | 0.19E-04 | -0.13E-42 | 0.24E-14 | 0.26E-06 |
| 0.579 | 0.18E-01 | 0.12-125 | 0.18E-01 | -0.29E-35 | -0.52E-11 | 0.30E-06 |
| 0.625 | 0.54E-04 | 0.15-118 | 0.49E-04 | 0.44E-60 | -0.25E-19 | 0.18E-06 |
| 0.670 | 0.31E-05 | 0.00E+00 | 0.14E-12 | 0.00E+00 | -0.13E-48 | 0.46E-11 |
| 0.716 | 0.22E-05 | 0.00E+00 | 0.34E-52 | 0.00E+00 | 0.00E+00 | 0.70E-12 |
| 0.762 | 0.15E-05 | 0.46E-55 | 0.30-108 | 0.14-208 | 0.76E-85 | 0.22E-12 |
| 0.807 | 0.13E-05 | 0.39E-20 | 0.32-184 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.853 | 0.13E-05 | 0.31E-07 | 0.13-285 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.899 | 0.41E-05 | 0.31E-05 | 0.32-249 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.944 | 0.16E-06 | 0.25E-09 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.990 | 0.41E-19 | -0.58E-25 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

Power sources integr. over rad. (RF+NBI, all gen.species)= 4.4778E+06W
 Power from intern ray diagnostic[powurf(0)]= 6.9992E+05W

| | | | |
|---|---|---|------------|
| mode/harmonic krf, nharm(krf), powurf(krf)= | 1 | 5 | 4.1786E+00 |
| mode/harmonic krf, nharm(krf), powurf(krf)= | 2 | 6 | 1.9142E+04 |
| mode/harmonic krf, nharm(krf), powurf(krf)= | 3 | 7 | 5.3769E+05 |
| mode/harmonic krf, nharm(krf), powurf(krf)= | 4 | 8 | 1.4186E+05 |
| mode/harmonic krf, nharm(krf), powurf(krf)= | 5 | 9 | 1.1815E+01 |
| mode/harmonic krf, nharm(krf), powurf(krf)= | 6 | 0 | 1.2190E+03 |

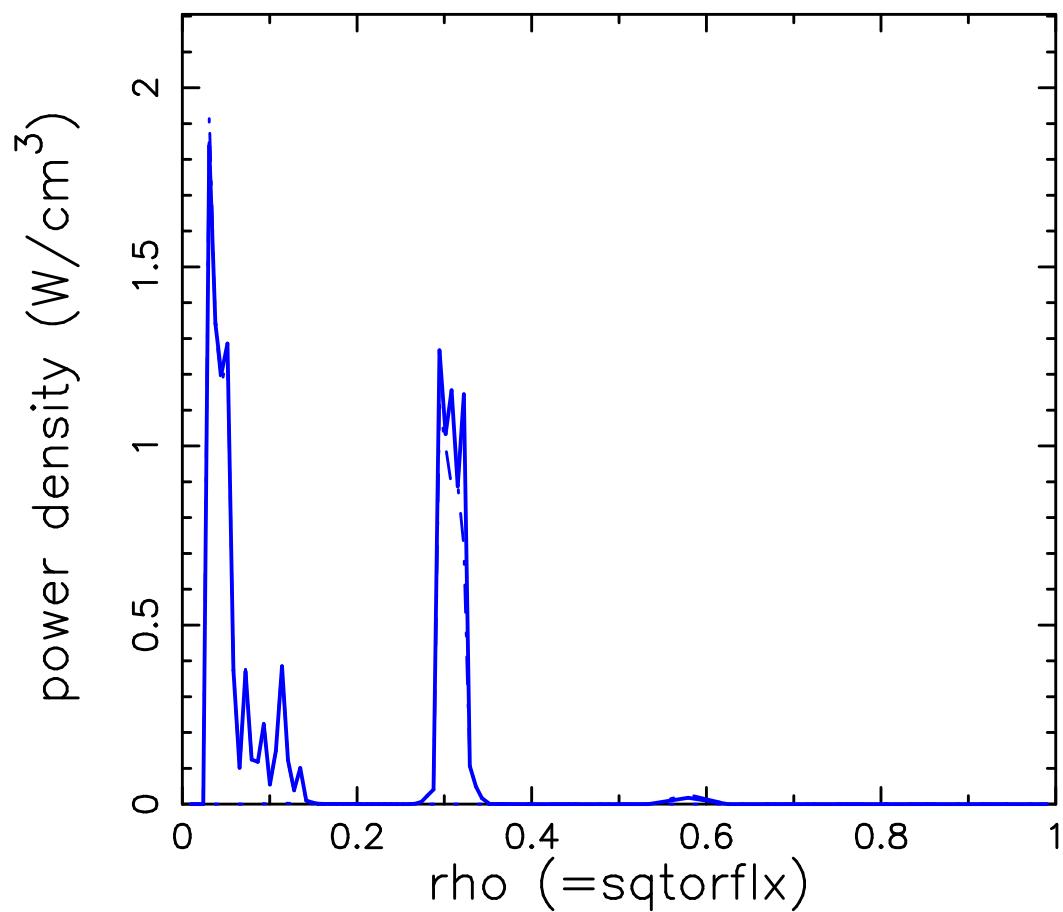
Power by collisions (from ray data) = 0.0000E+00W
 Power by linear damping (from ray data)= 0.0000E+00W

FSA SOURCE POWER DEN: (WATTS/CM³)
 Solid: NBI(or KO)+RF for all gen.sp.[sorpwt]
 Dashed: NBI (or KO) [sorpw_nbi]
 Solid-bold: total absorbed RF power [powrft]
 Other: RF general species (each) [sorpw_rf]

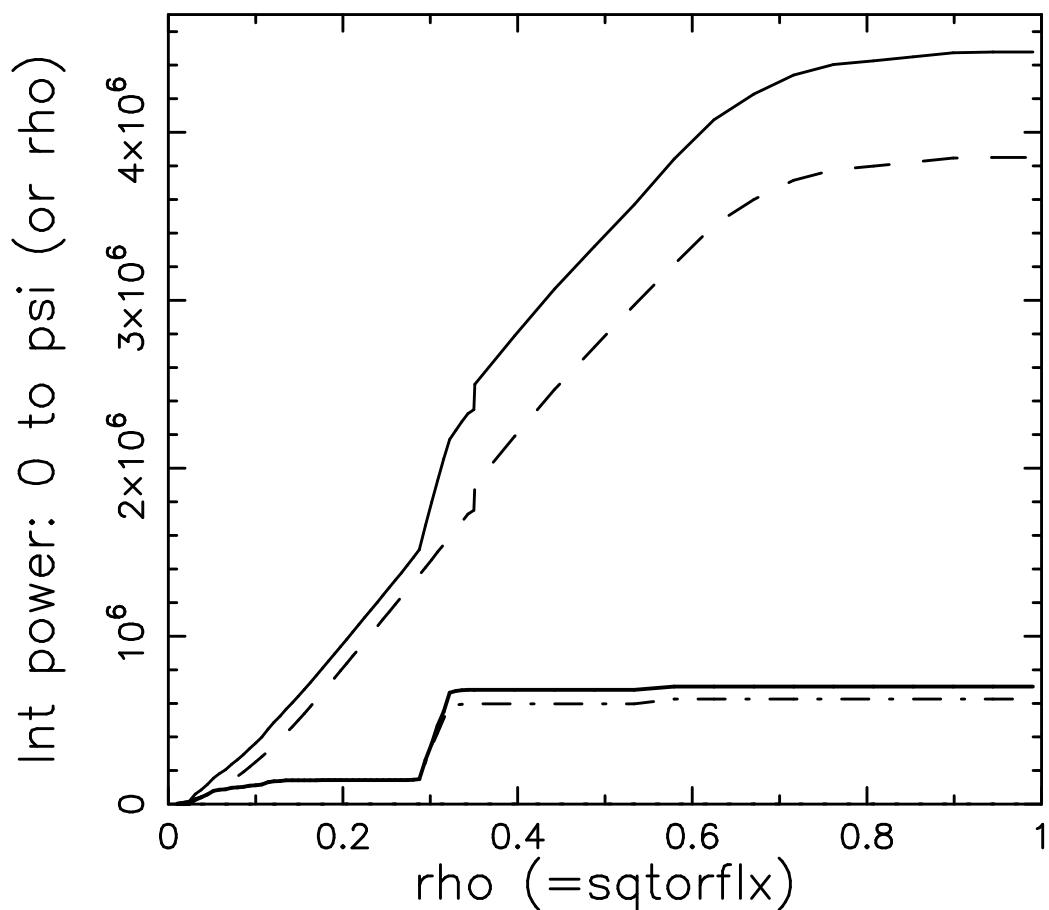


FSA RF POWER DEN: (WATTS/CM³)

Solid—bold: total absorbed RF power [powrft]
Other: RF general species (each) [sorpw_rf]



SOURCE POWER (integr. up to rho or psi) (WATTS)
 Solid: NBI(or KO)+RF for all gen.sp.[sorpwti]
 Dashed: NBI(or KO) [sorpw_nbii]
 Solid-bold: total absorbed RF [powurfi(*,0)]
 Other: RF general ions (each) [sorpw_rfi]



RF POWER (integr. up to rho or psi) (WATTS)

Solid—bold: total absorbed RF [powurfi(*,0)]
Other: RF general species (each) [sorpw_rfi]

