STUDY II: m1507 vs. m1510

IDS120f: m1507/MCNP vs. M1510/MCNP vs. FLUKA

IDS120f vs. IDS20g GEOMETRY

IDS90f: B10/B11 SHIELDING RING(S) STUDIES

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Energy deposition from mars1507 and mars1510.

STUDY II GEOMETRY.

SHIELDING: 80%WC+20% H_2O

4MW proton beam.

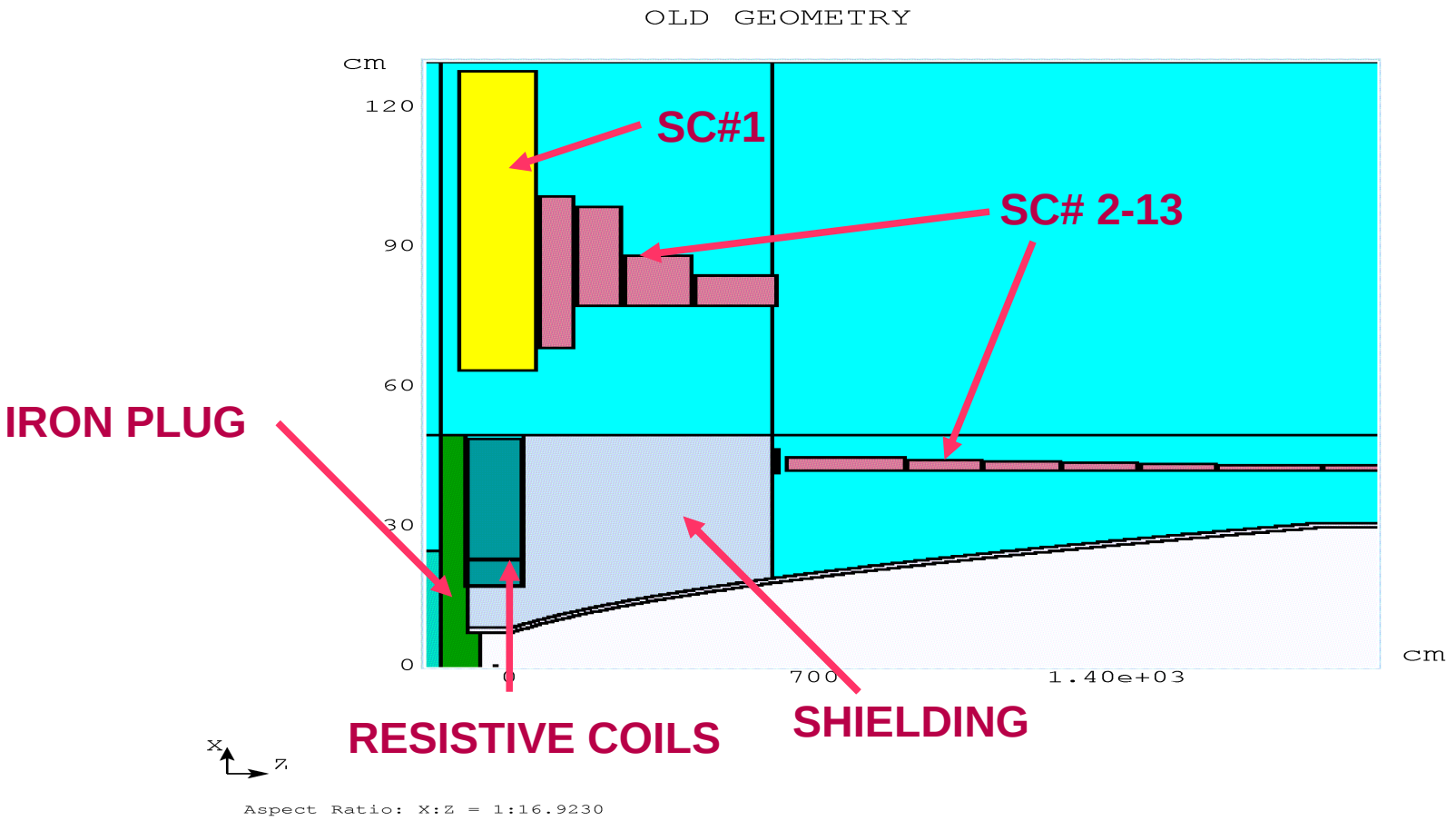
Now E=8 GeV,

GAUSSIAN PROFILE: $\sigma_x=\sigma_y=0.12$ cm.

N_p=100,000 events

Default neutron cutoff E_n>0.1 MeV

STUDY II SOLENOID GEOMETRY, 13 SUPERCODUCTIN COILS (SC)



SC#1 -120<z<57.8 cm R_{in}=63.3 cm R_{out}=127.8 cm

SC#2 67.8<z<140.7 cm R_{in}=68.6 cm R_{out}=101.1 cm

SC#6-13 632.5<z<218.7 cm R_{in}=42.2 cm R_{out}=45.1-->43.4 cm (TOTAL # SC=13)

m1507 vs. m1510 FOR STUDY II GEOMETRY
(m1510-m1507)/m1510 %

	m1507	m1510	%
SC#1	24.73	28.27	+12.52
SC#12-13	12.09	11.81	-2.37
Hg Jet	389.80	403.4	+3.37
BeWind	2.88	0.66	-336.36
BP	418.95	418.5	-0.11
RS	116.1	136.3	+14.82
Ceramic	2.93	3.59	+18.38
Feco#3	9.96	11.05	+9.86
Total	977.44	1013.58	+3.57

Be Wind.: BUT WHY????

Power deposition for IDS120f:

mars1507/MCNP vs. mars1510/MCNP vs. FLUKA

10^{-11} MeV NEUTRON ENERGY CUTOFF

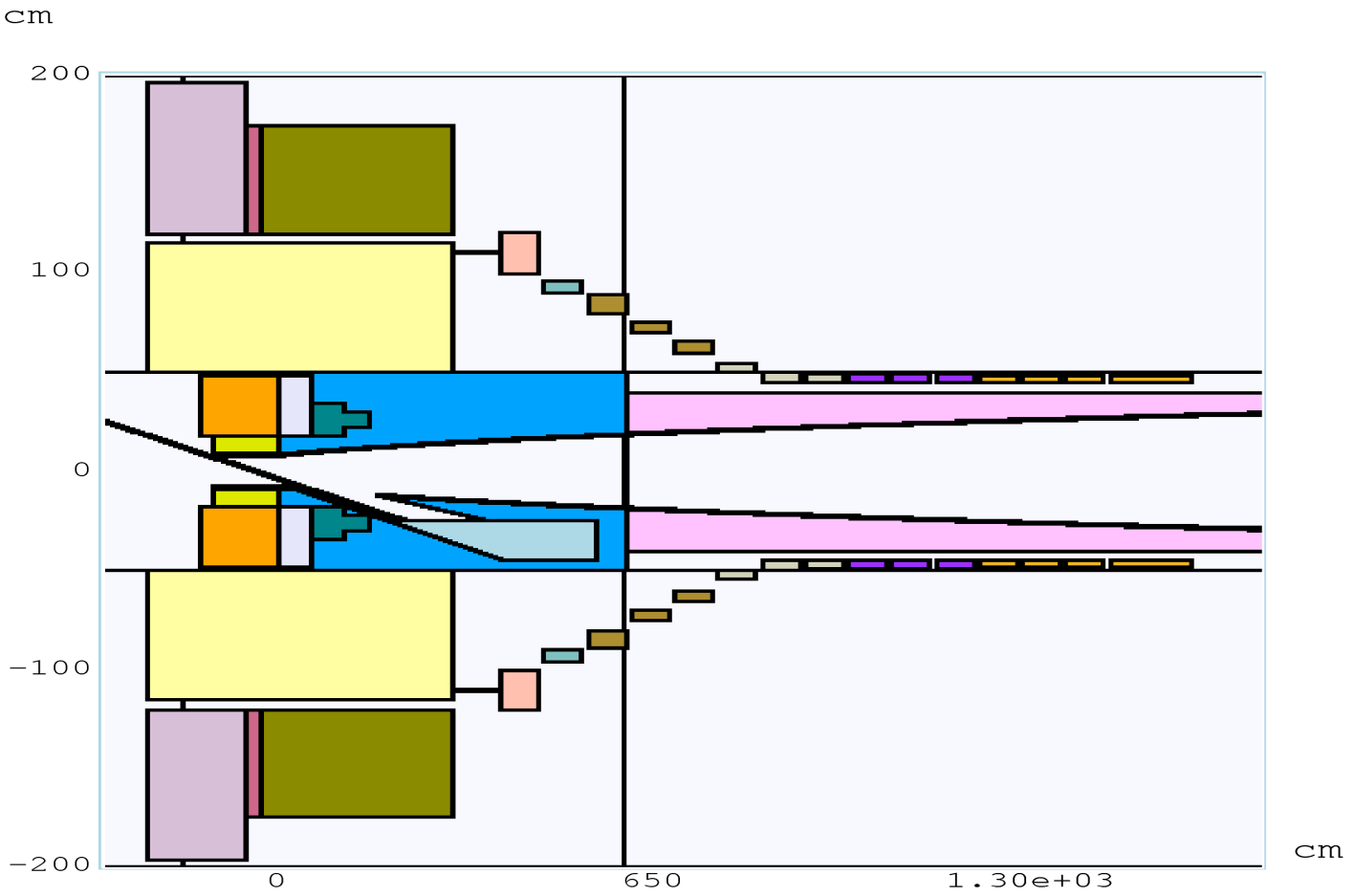
>SHIELDING: 60%WC+40%H_2O

>4 MW proton beam, Np=400,000

>PROTONS ENERGY E=8 GeV.

>GAUSSIAN PROFILE: $\sigma_x=\sigma_y=0.12$ cm.

IDS120f GEOMETRY



ENERGY DEPOSITED IN SC SOLENOIDS (SC#), SHIELDING (SH#).

NiSn/NiTi	m1507	m1510	FLUKA
SC#1	0.034	0.044	0.052
SC#2	0.025	0.039	0.032
SC#3	0.26	0.28	0.26
SC#4	0.004	0.004	0.004
SC#5	0.19	0.17	0.066
SC#6	0.049	0.041	0.014
SC#1-6	0.60	0.58	0.43
SC#7-9	0.12	0.13	0.047
SC#10-12	0.09	0.09	0.036
SC#13-15	0.08	0.1	0.021
SC#16-19	0.08	0.027	0.027
SC#1-19	0.97	0.99	0.56

NiSn/NiTi	m1507	m1510	FLUKA	60/40	m1507	m1510	FLUKA
SC#1-6	0.60	0.58	0.43	SH#1	924.0	962.5	1050.0
SC#7-9	0.12	0.13	0.047	SH#2	1015.0	1030.5	1018.0
SC#10-12	0.09	0.099	0.036	SH#3	36.78	38.21	20.0
SC#13-15	0.08	0.1	0.021	SH#4	44.28	47.22	60.9
SC#16-19	0.08	0.08	0.027	–	–	–	–
SC#1-19	0.97	0.99	0.56	SH#1-5	2020.06	2078.43	2148.9

ENERGY DEPOSITED IN RESISTIVE COILS (RS#), BEAM PIPE (BP#).

Cu	m1507	m1510	FLUKA	(STST)	m1507	m1510	FLUKA
RS#1+2	167.0	180.05	190.1	BP#1	203.7	212.8	237.6
RS#3	88.5	93.1	140.0	BP#2	249.2	245.9	(2+3)
RS#4+5	74.05	76.3	75.0	BP#3	5.49	5.54	245.2
RS#1-5	329.55	349.45	405.1	BP#1-3	458.39	464.29	482.8

IDS120f:ENERGY DEPOSITED IN OTHER PARTS AND TOTALS.

TOTALS	m1507	m1510	FLUKA
SC#1-19	0.97	0.99	0.56
SH#1-4	2020.06	2078.43	2148.9
RS#1-5	329.55	349.45	405.1
BP#1-3	458.39	464.29	482.8
Hg TARG.	376.5	389.85	319.0
Hg POOL	10.16	10.53	4.4
Be WIND.	0.53	0.73	2.1
TOTAL	3196.16	3294.27	3362.86

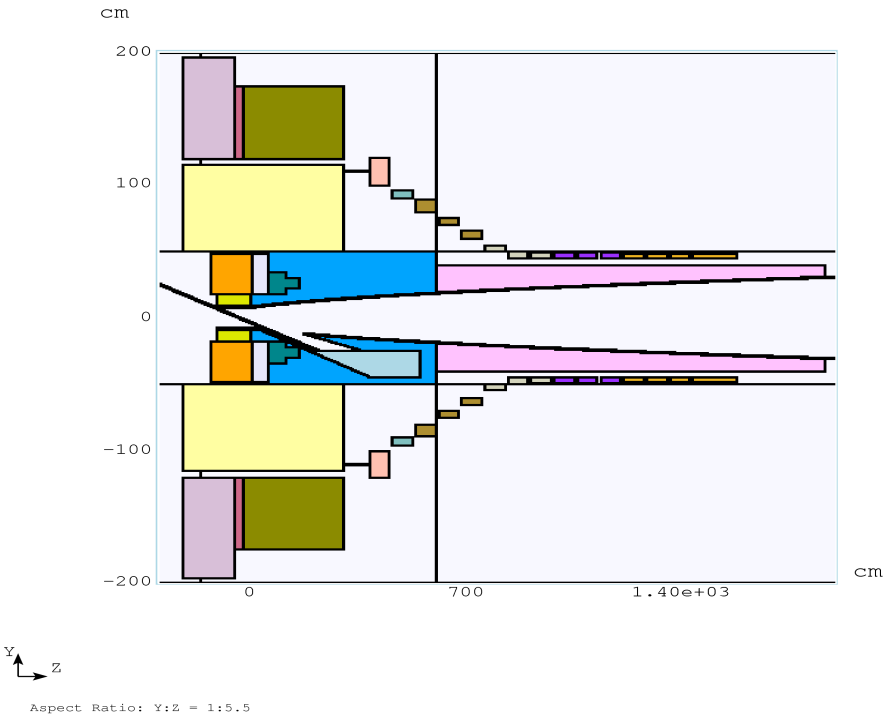
HIGHLIGHTS... :(mars1507/mars1510/FLUKA)

Power Deposited: SC#3: 0.26/0.28/0.26 kW,
SC#5: 0.19/0.17/0.066 kW
SC#1-19: 0.97/0.99/0.56 kW

Peak: SC#3: 0.03/0.018/0.05 mW/gr

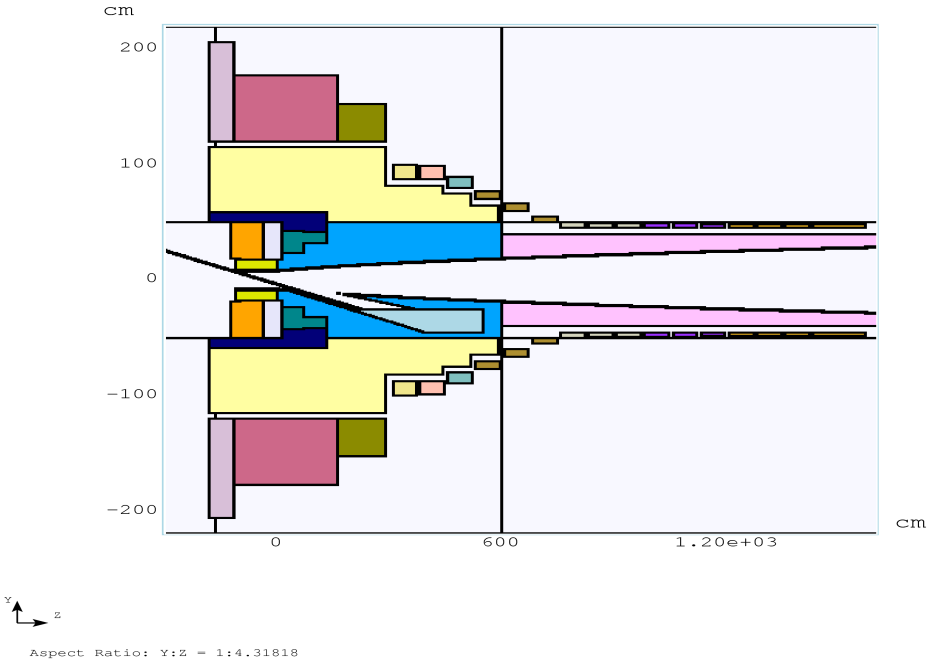
IDS120f and IDS120g geometries.

IDS120f



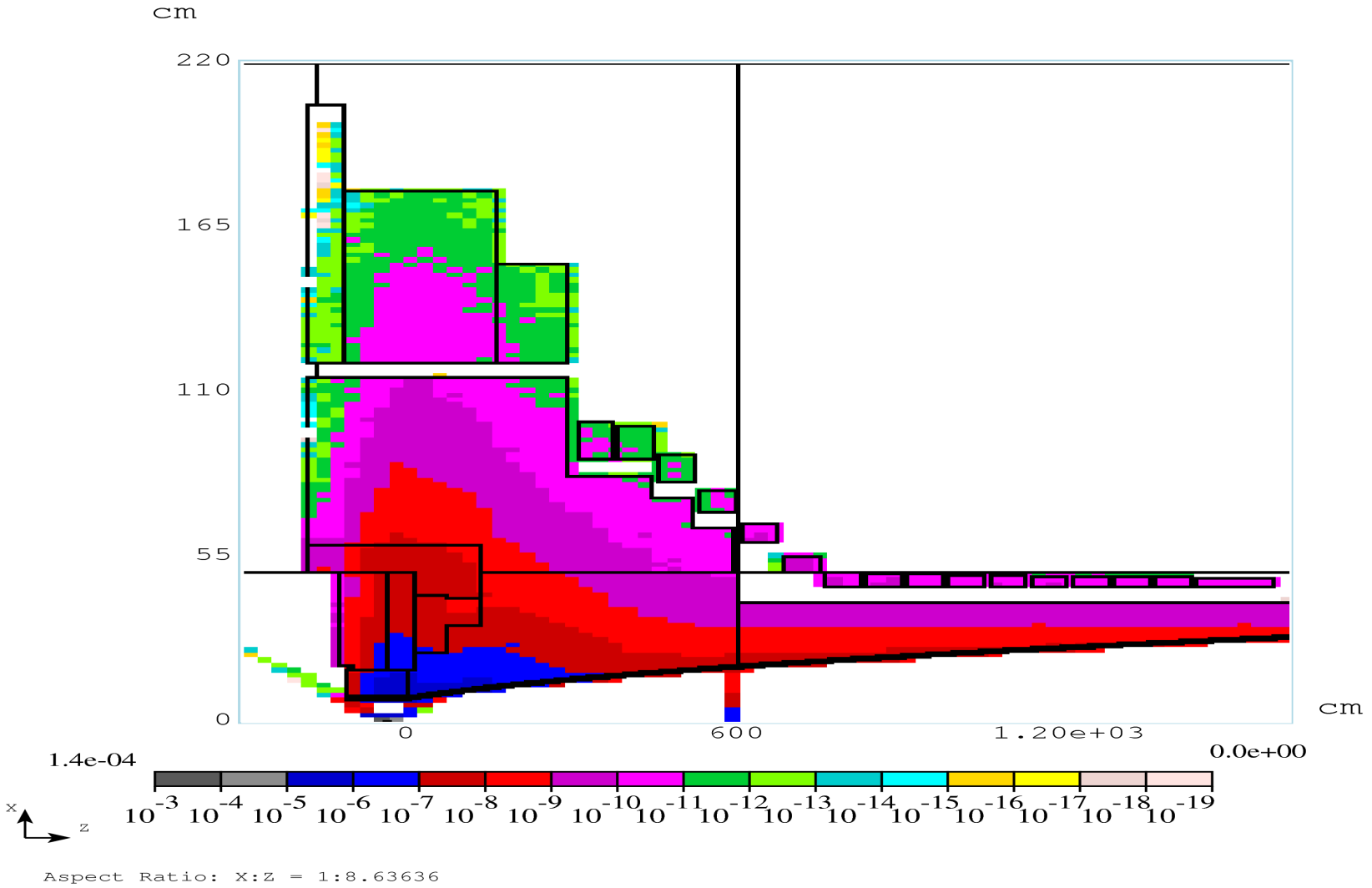
DP: SC#3: 0.28 kW
SC#5: 0.17 kW
SC#1-19: 0.99 kW
DPT: ~3.3 MW~82.5 % PBP
DPP: SC#3: 0.018 mW/gr
SC#7: 0.065 mW/gr
SC#14: 0.08 mW/gr

IDS120g: water cooling rings around RS



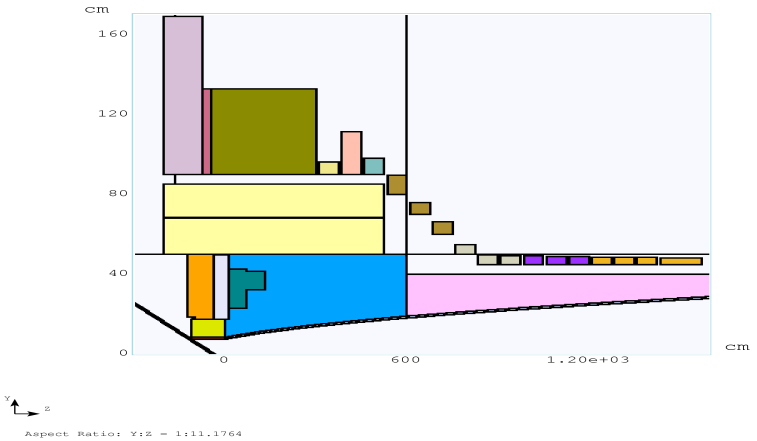
DP: SC#2: 0.54 kW
SC#3: 0.05 kW
SC#1-19: 0.95 kW
DPT: ~3.3 MW~82.5 % PBP
DPP: SC#2: 0.03 mW/gr
SC#4: 0.017 mW/gr
SC#9/10: 0.08 mW/gr

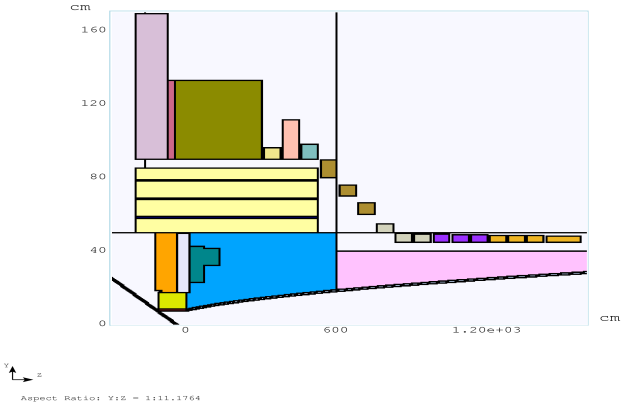
IDS120g geometry:Deposited Power Histogram



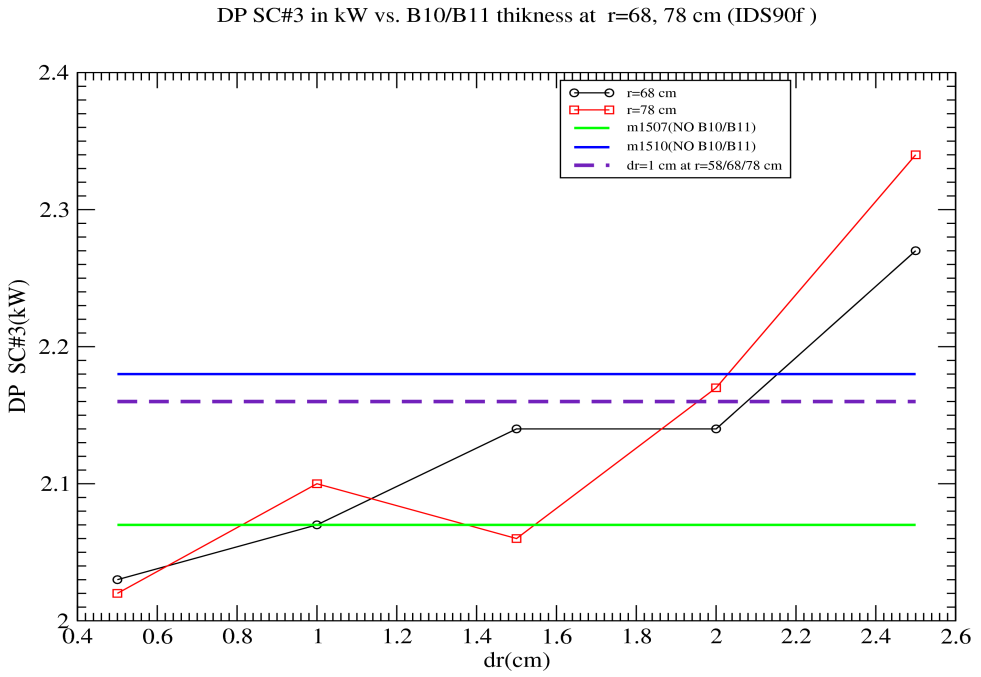
H_2O AREA GETS ABOUT 11.3 kW FROM RADIATION ALONE

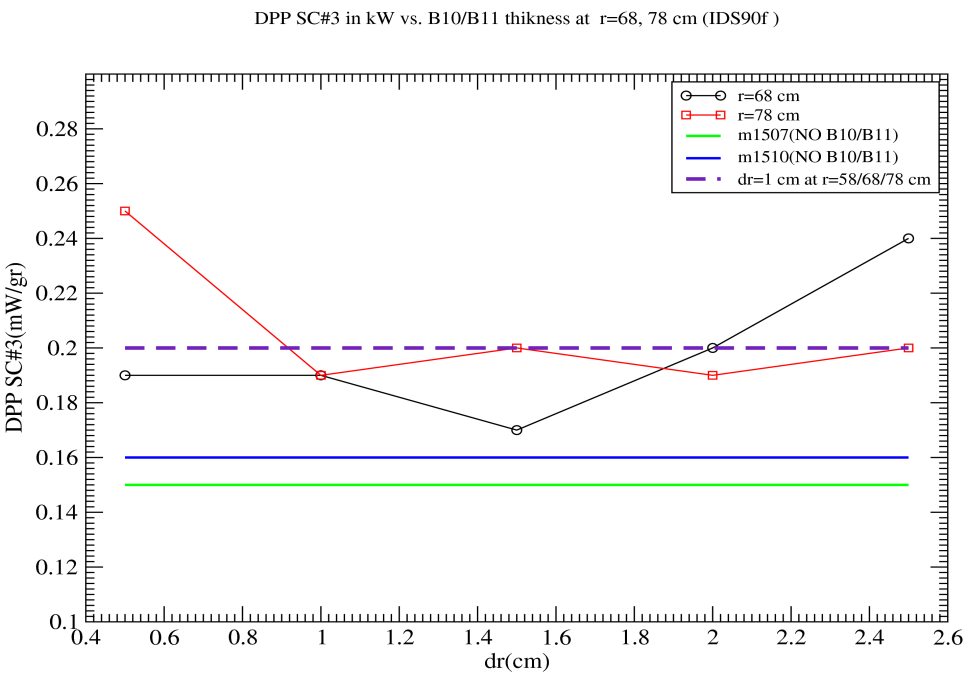
IDS90f geometry:SC#3 DP, DPP with B10/B11 ring(s) (From Dr. Brooks comments/suggestions)





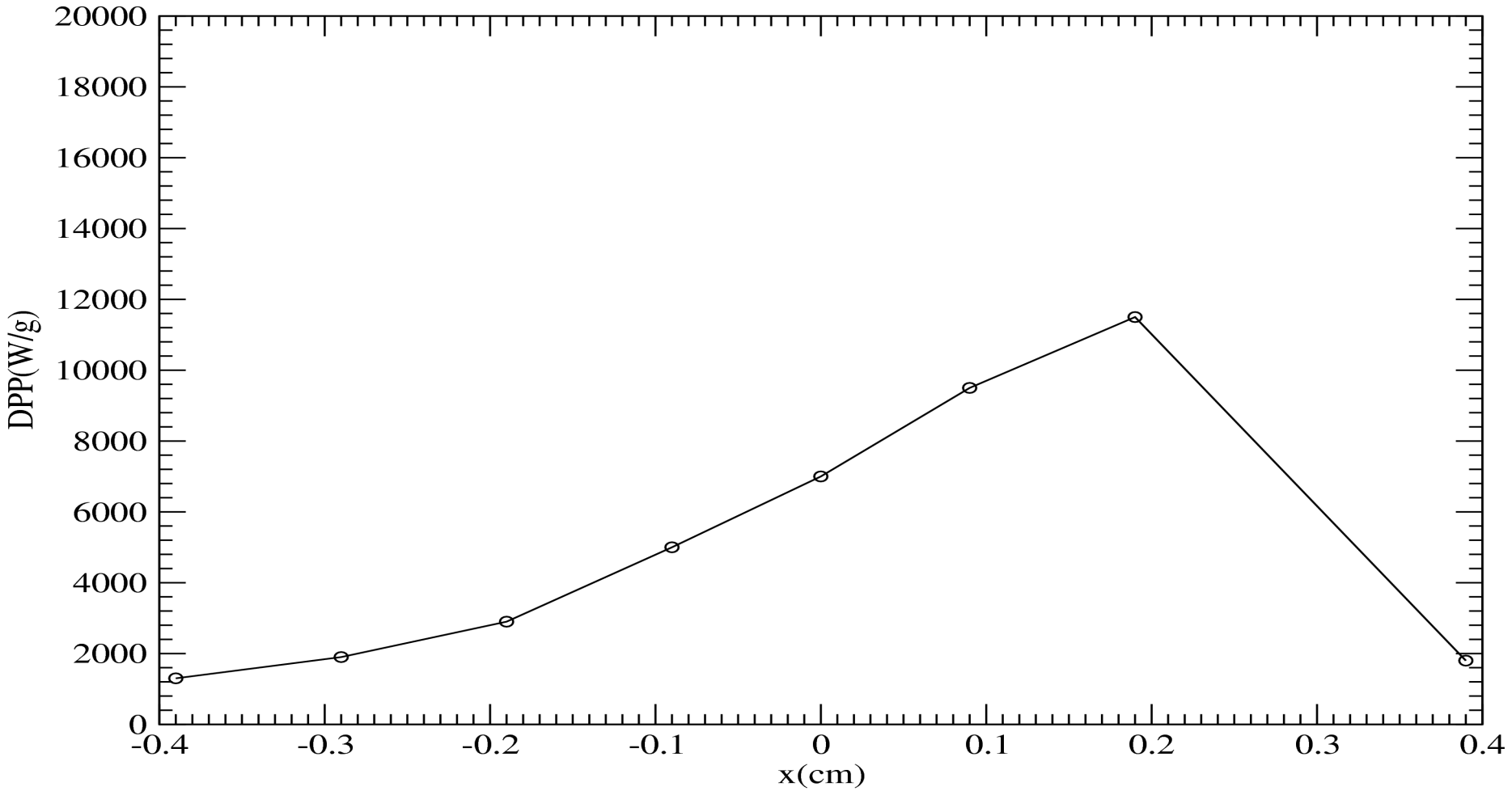
DP in kW SC#3:2.07 (m1507)/2.18 (m1510)/2.16 (3 dr=1 cm B10/B11 rings)
DPP in mW/g SC#3: 0.15 (m1507)/0.16 (m1510)/0.20 (3 dr=1 cm B10/B11 rings)





Hg DPP STUDIES FOR dx=0.02cm "SLICE" SHIFTED ALONG THE x-AXIS FROM -0.4 TO 0.4 cm AND FOR -6.0<y<6.0 cm dy=0.06 cm, -100<z<60 cm dz=0.434 cm

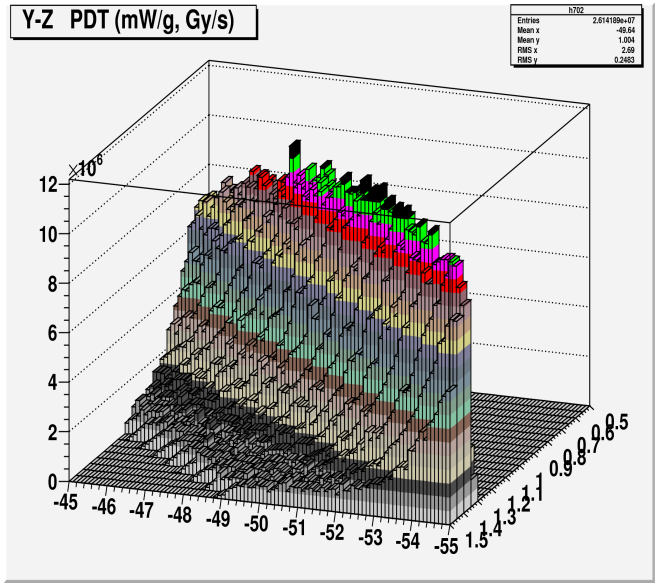
PROTON BEAM: x=0.319 cm y=2.91 cm z=-75 cm, dcx= -0.078 dcy=0.996 dcz=1.0



DPP~11,500 W/g AT x~0.19 cm y~1.0 cm z~-50 cm

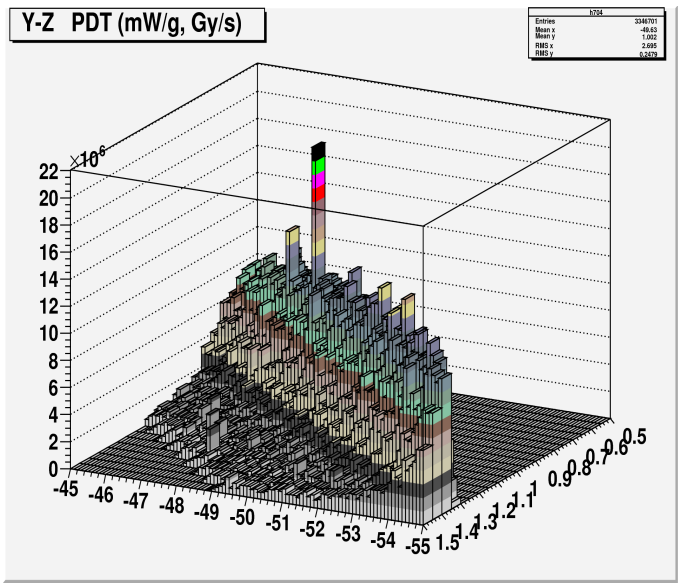
Hg DPP STUDIES FOCUSING AROUND THE DP PEAK AREA FOR 0.5<y<1.5 cm dy=0.05 cm, -55<z<-45 cm dz=0.10 cm

0.15<x<0.25 cm
dx=0.1 cm



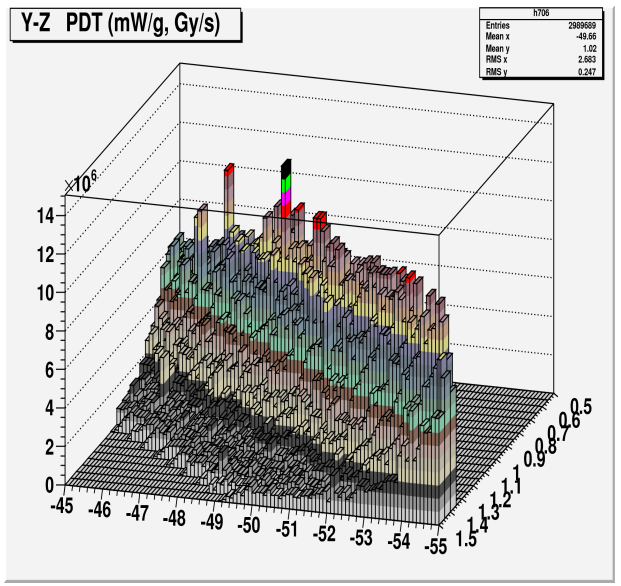
DPP~11,000 W/g AT
x~0.2 cm
0.95<y<1.2 cm
-53<z<-51 cm

0.19<x<0.20 cm
dx=0.01 cm



DPP~20,000 W/g AT
x~0.195 cm
y~0.82 cm
Z~-48.6 cm
<DPP>~12,000 W/g

0.23<x<0.24 cm
dx=0.01 cm



DPP~13,500 W/g AT
x~0.235 cm
y~0.92 cm
Z~-49.2 cm
<DPP>~11,000 W/g