Six cavity test. TRACK simulations.

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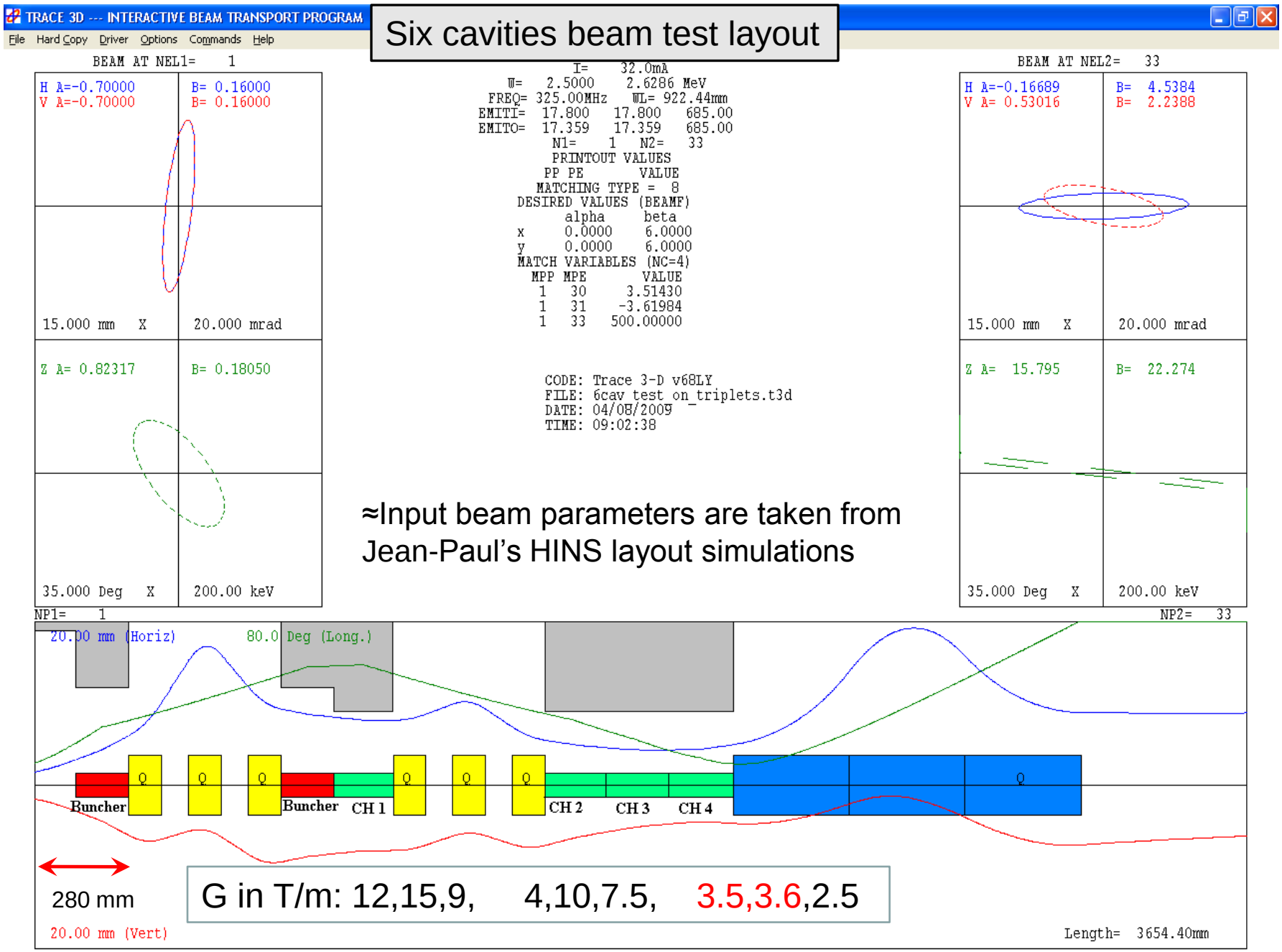
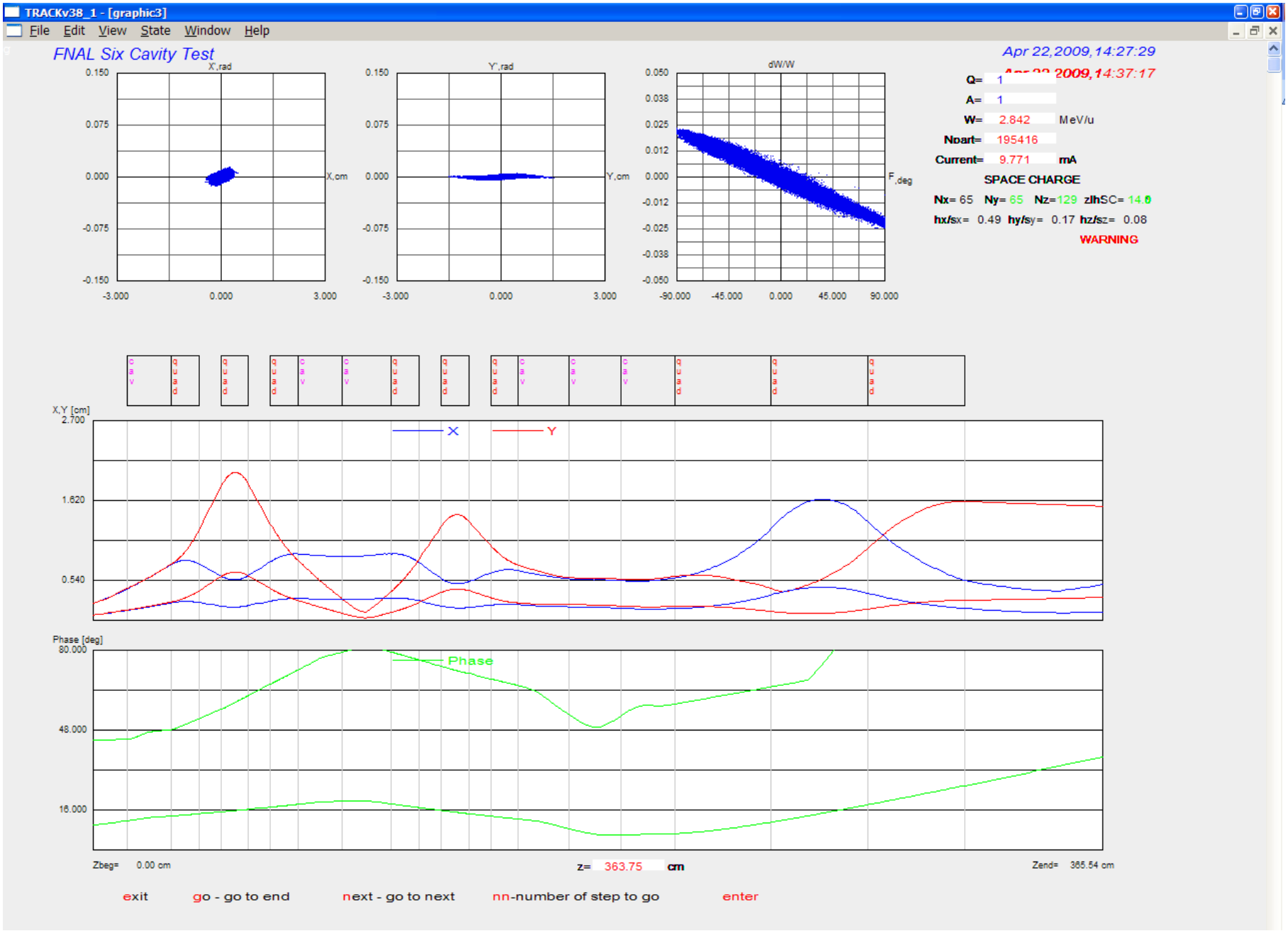
April 23, 2009

Six cavities beam test layout



≈Input beam parameters are taken from Jean-Paul's HINS layout simulations

G in T/m: 12,15,9, 4,10,7.5, 3.5,3.6,2.5


TRACKv38_1 - [graphic3]
File Edit View State Window Help
FNAL Six Cavity Test
Apr 22,2009,14:27:29
Apr 22,2009,14:37:17
X',rad
X,cm
Y',rad
Y,cm
dW/W
F,deg
Q= 1
A= 1
W= 2.842 MeV/u
Npart= 195416
Current= 9.771 mA
SPACE CHARGE
Nx= 65 Ny= 65 Nz=129 zlhSC= 14.6
hx/sx= 0.49 hy/sy= 0.17 hz/sz= 0.08
WARNING
X,Y [cm]
X
Y
Phase [deg]
Phase
Zbeg= 0.00 cm
z= 363.75 cm
Zend= 365.54 cm
exit
go - go to end
next - go to next
nn-number of step to go
enter

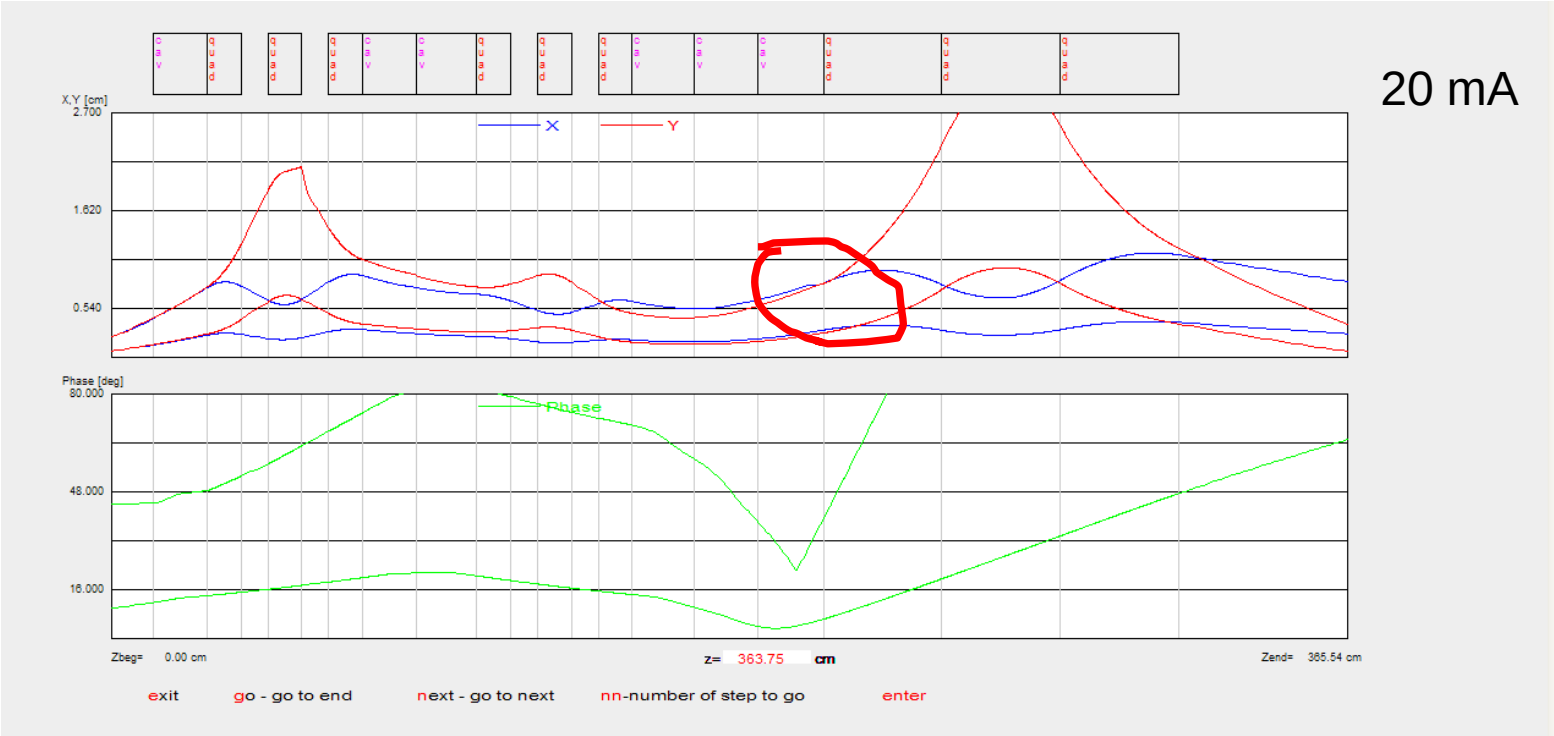
Quad gradients, T/m

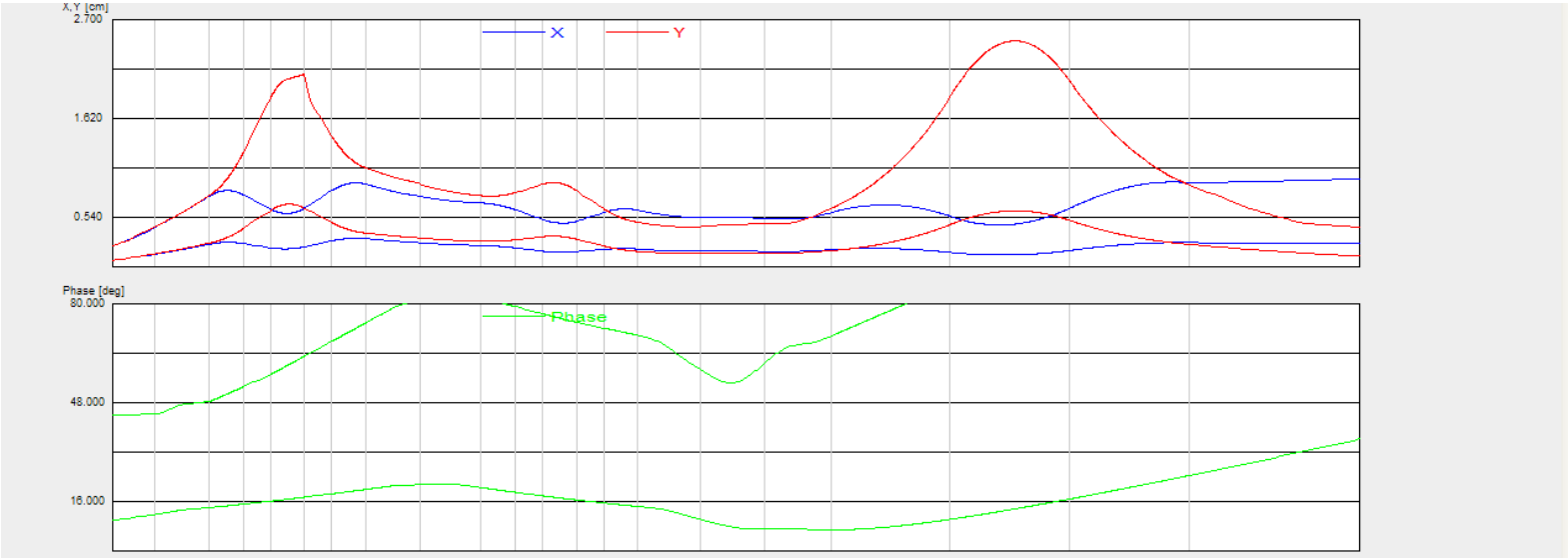
Quad	10 mA	20 mA	
1	12.2	11.93	
2	16.58	15.46	Close to limit
3	7.1	8.75	
4	8.3	4.12	
5	16.1	9.82	
6	7.8	7.37	
7	2.73	2.73	
8	3.45	3.45	Exceeds limit
9	1.82	1.82	

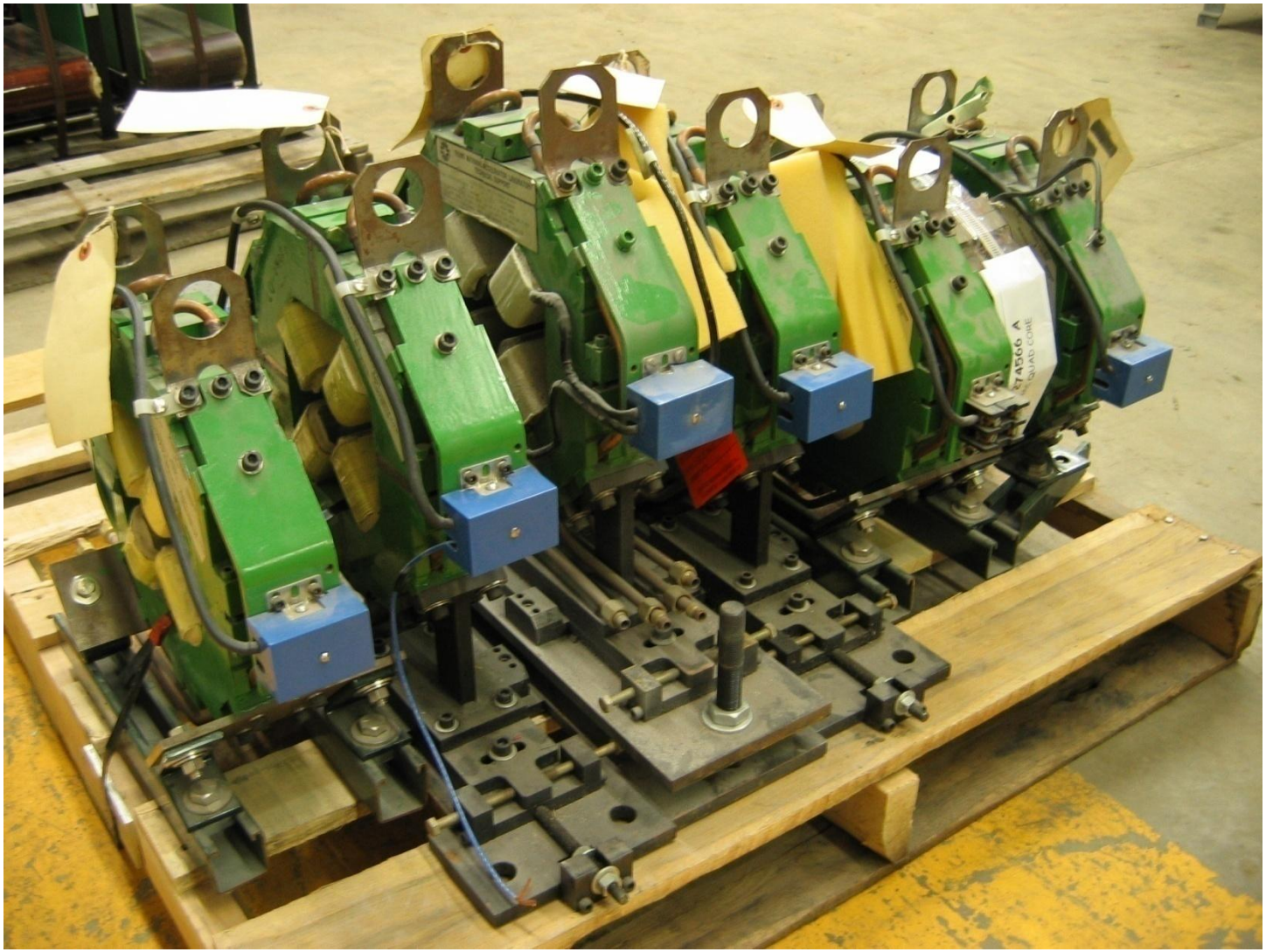
Accelerating gradients and phases

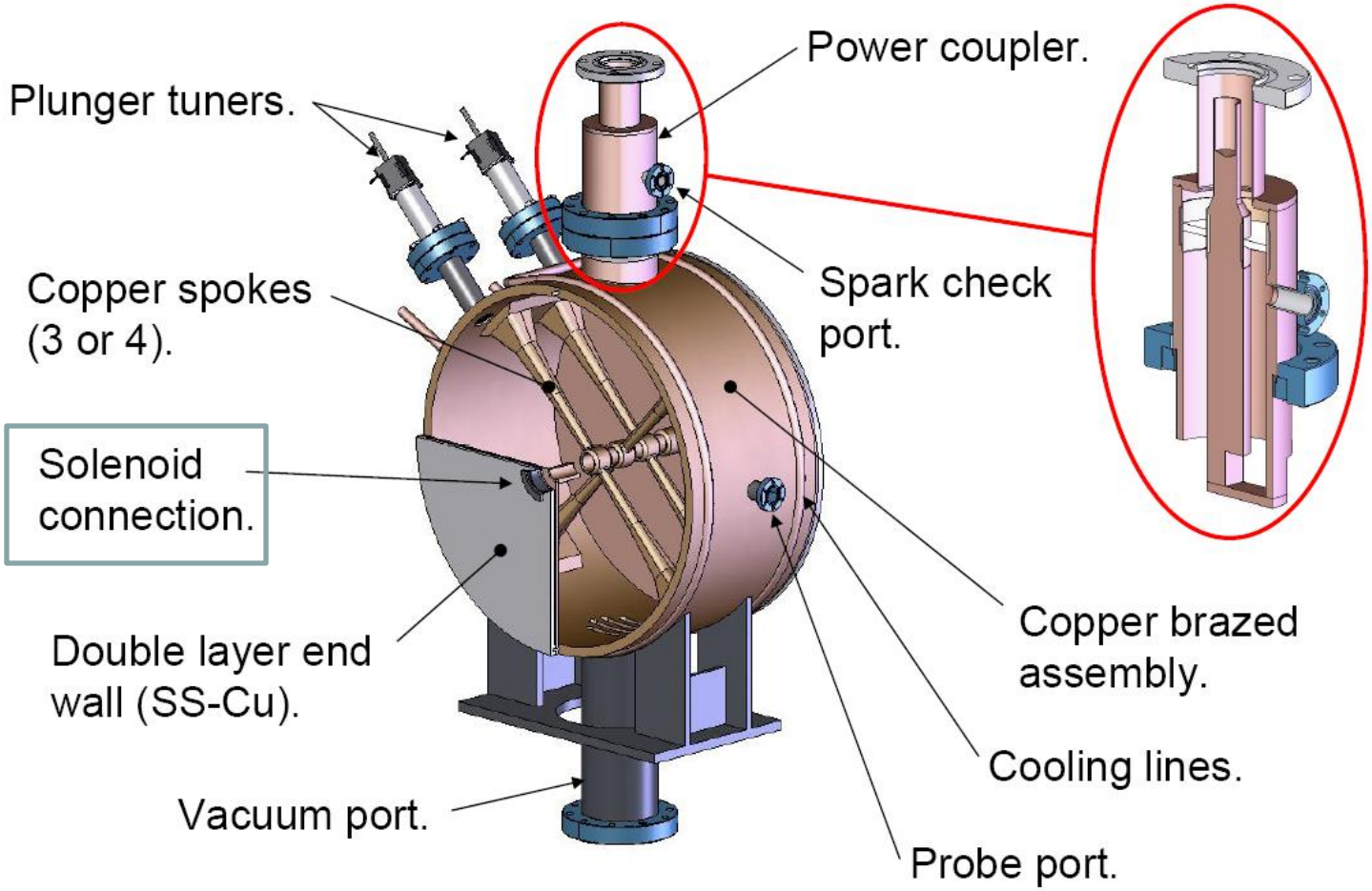
Cav	E_eff, kV	ϕ, deg	E nom, kV
1	120	-90	173
2	45	-90	139
3	50	-90	181
4	50	-50	277
5	50	50	299
6	100	-50	334

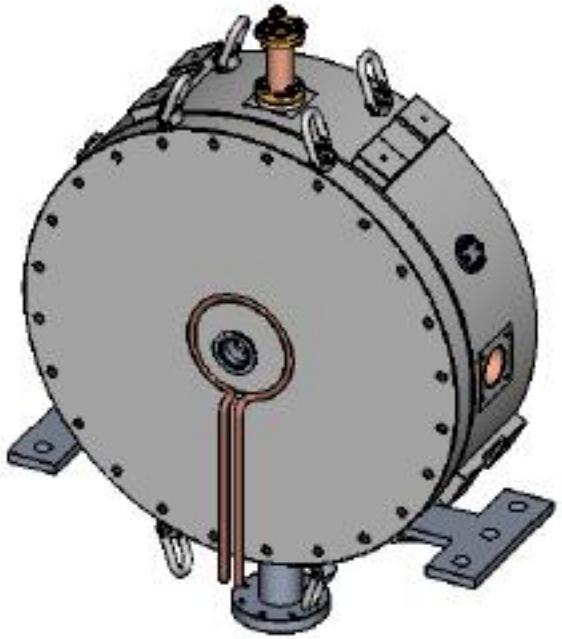
Alternative phase focusing + weaker space charge forces due to longer bunch


20 mA
X,Y [cm]
2.700
1.620
0.540
X
Y
Phase [deg]
80.000
48.000
16.000
Phase
Zbeg= 0.00 cm
z= 363.75 cm
Zend= 365.54 cm
exit
go - go to end
next - go to next
nn-number of step to go
enter


X,Y [cm]
2.700
1.620
0.540
X
Y
Phase [deg]
80.000
48.000
16.000
Phase




Power coupler.
Plunger tuners.
Spark check port.
Copper spokes (3 or 4).
Solenoid connection.
Double layer end wall (SS-Cu).
Copper brazed assembly.
Cooling lines.
Vacuum port.
Probe port.



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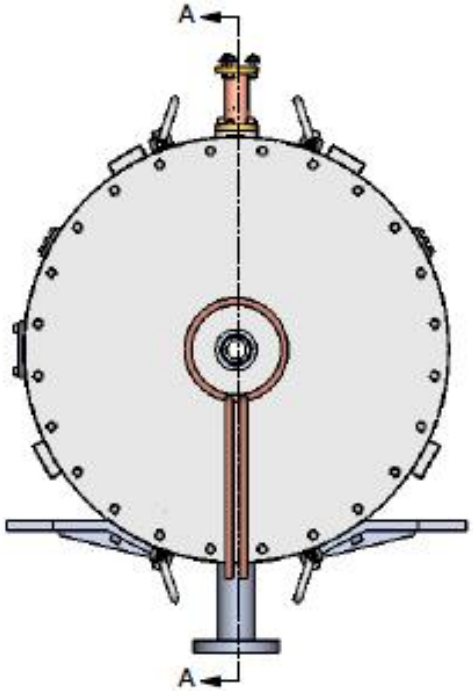
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