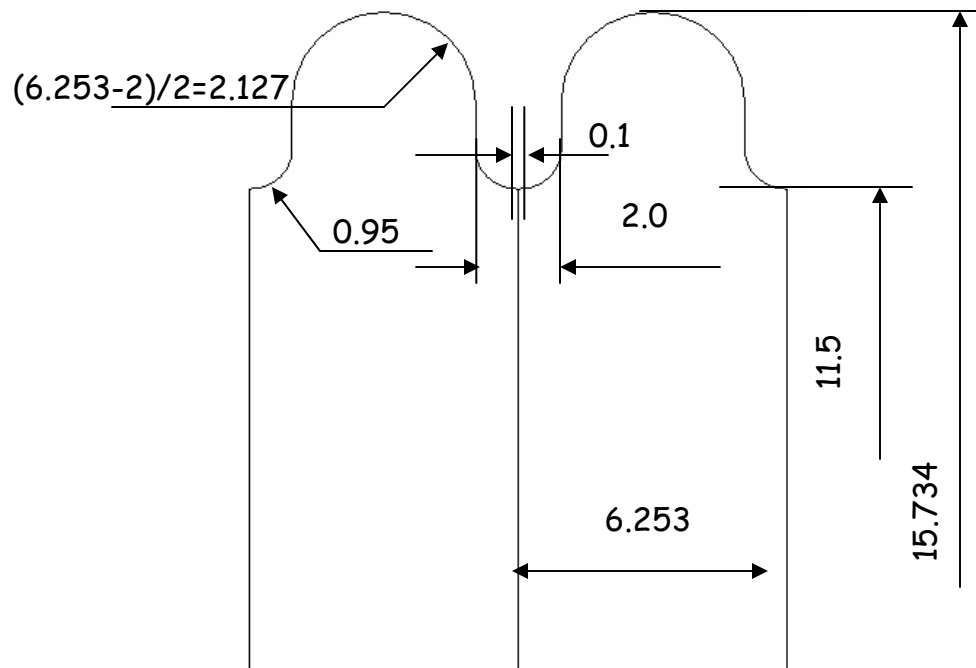


12 GHz TBL PETS design

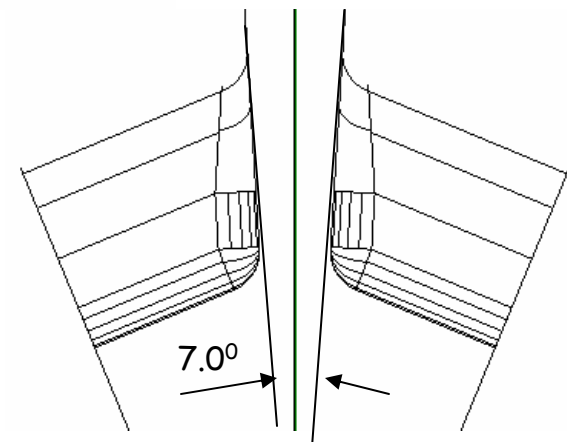
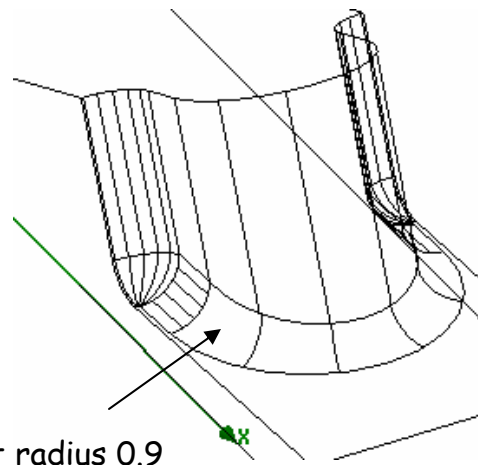
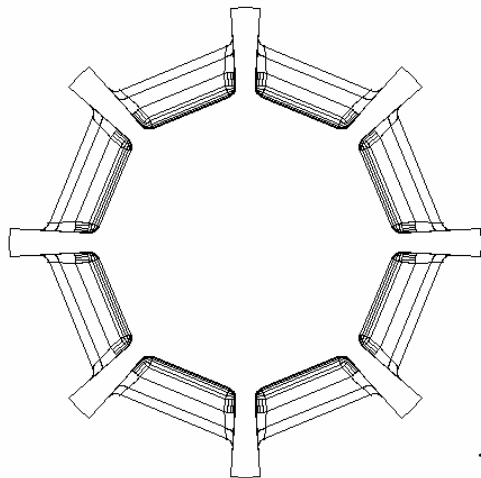
Regular cell

PETS parameters:

- Frequency = 11.9942 GHz
- Aperture = 23 mm
- Period = 6.253 mm (90°/cell)
- Iris thickness = 2 mm
- R/Q = 2258 Ω
- V group = 0.453
- Q = 7240
- E surf. (174 MW) = 64 MV/m
- H surf. (174 MW) = 0.1 MA/m
(ΔT max (140 ns, Cu) = 2.0 C°)



X-band PETS cross-section



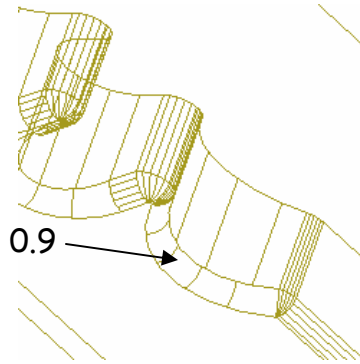
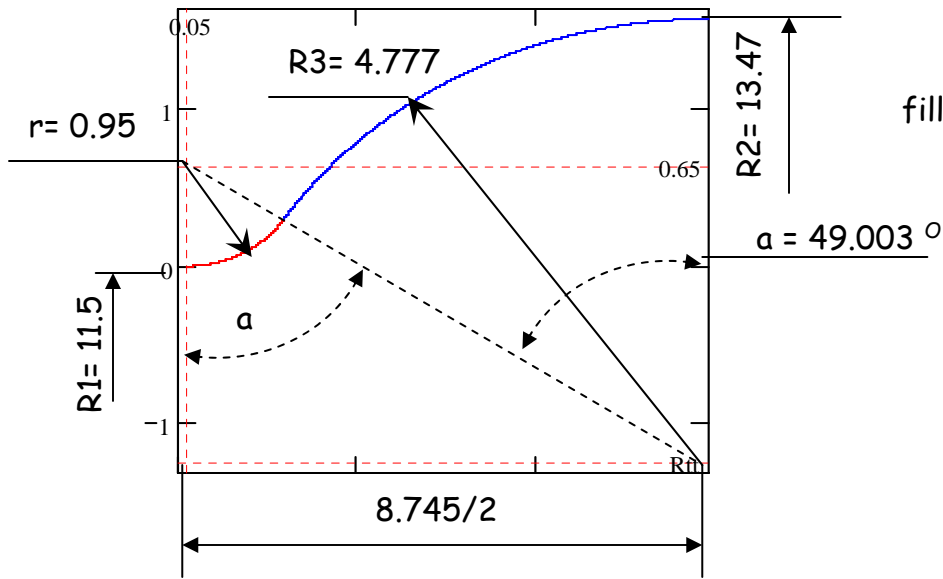
HFSS project:

 12_GHz_cell

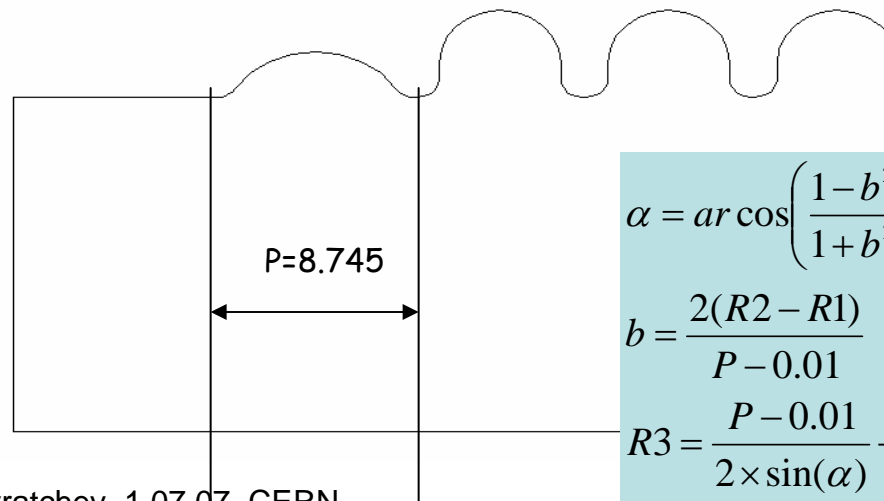
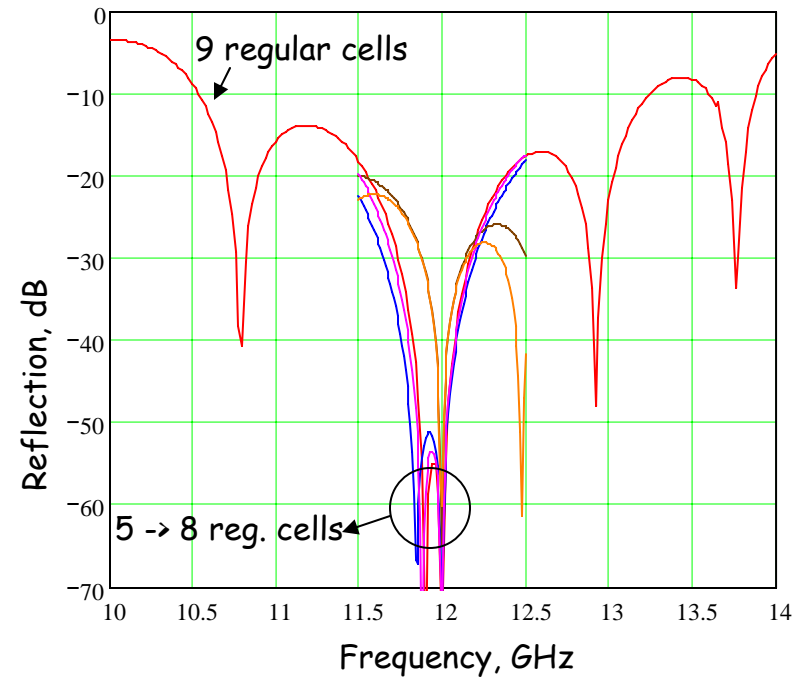
hfss

Matching cell

Matching cell geometry (half cell)



fillet radius 0.9

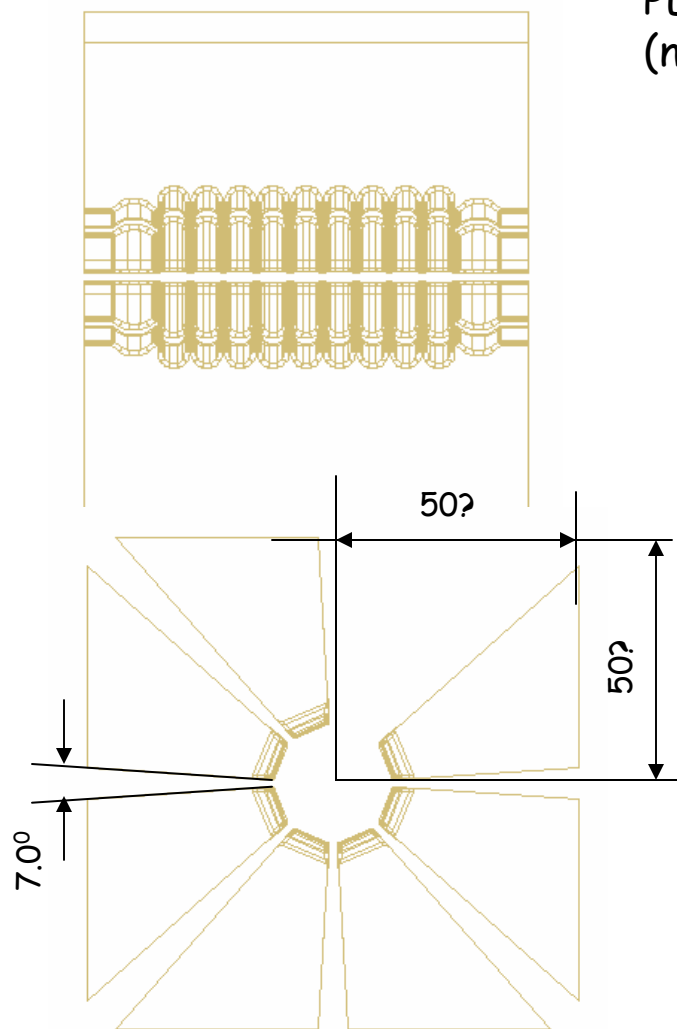
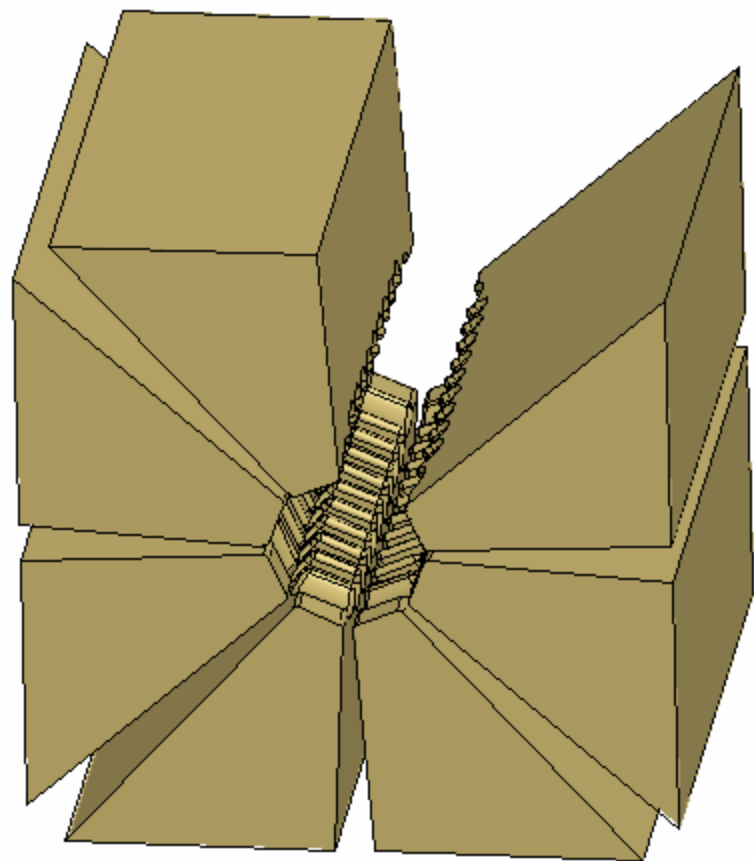


$$\alpha = \arccos\left(\frac{1-b^2}{1+b^2}\right)$$

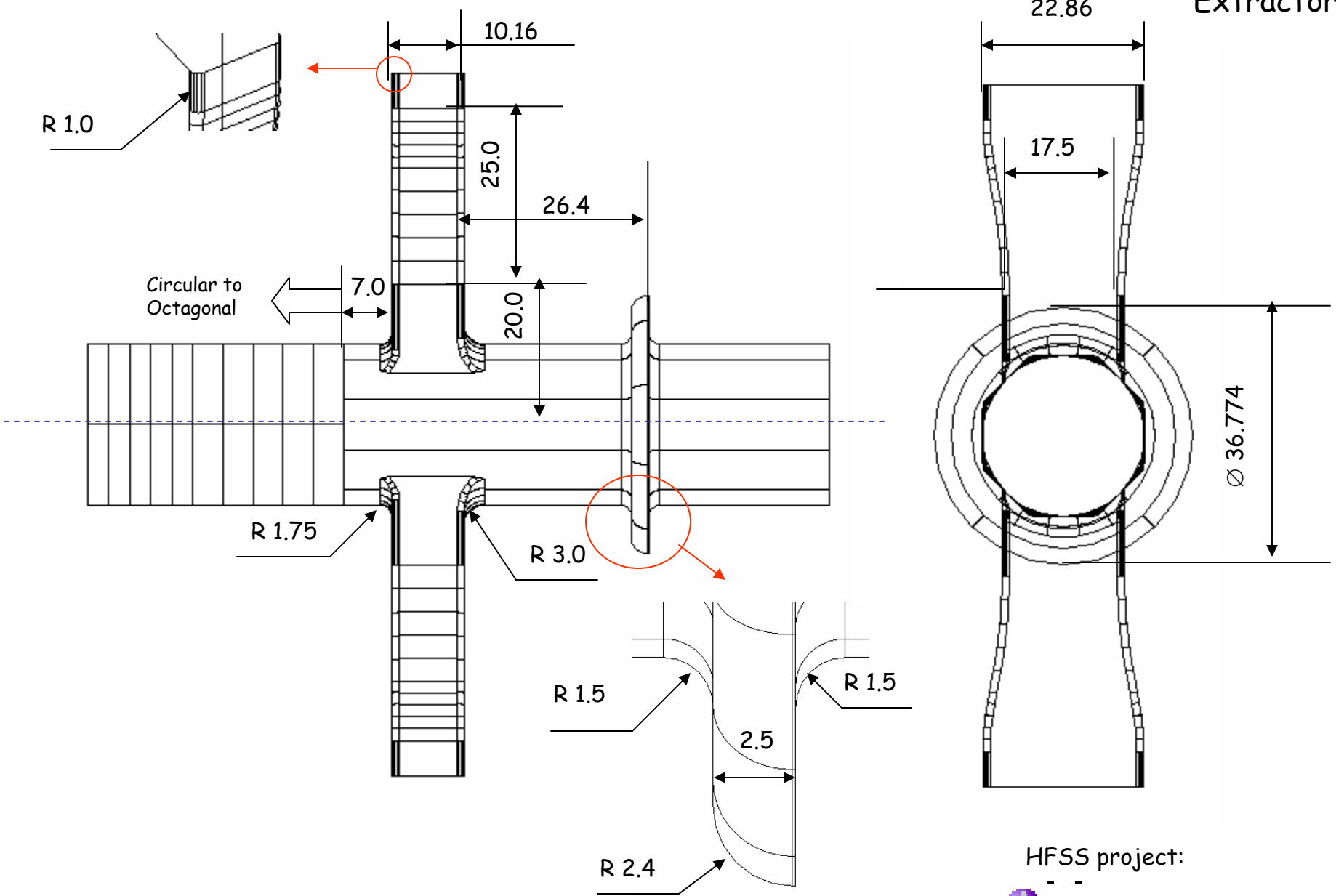
$$b = \frac{2(R2 - R1)}{P - 0.01}$$

$$R3 = \frac{P - 0.01}{2 \times \sin(\alpha)} - r$$

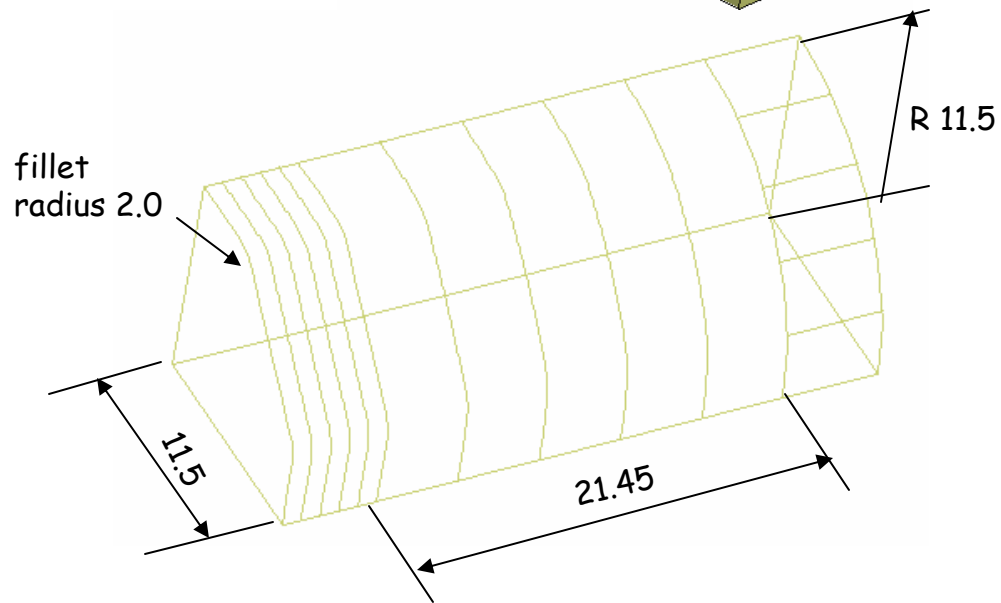
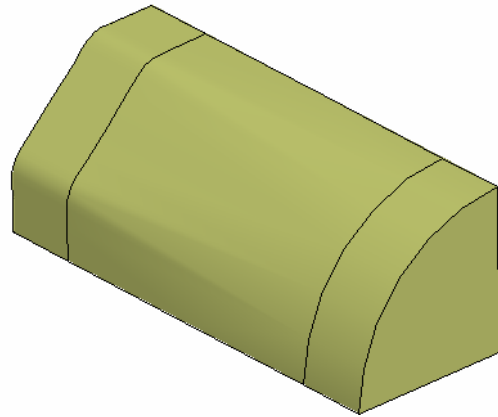
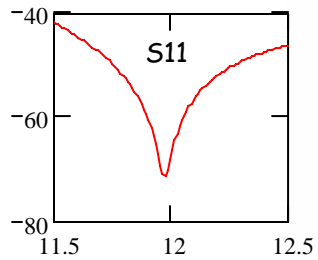
PETS octants
(no damping yet)




Extractor 23 mm



Circular to Octagonal



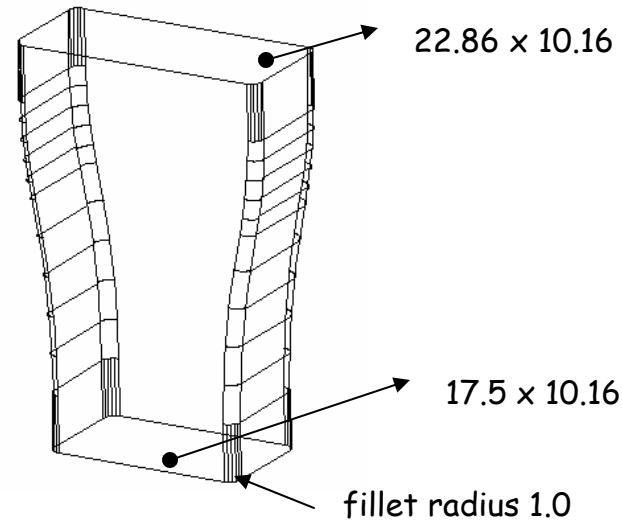
HFSS project:

 **Oct_Circ**

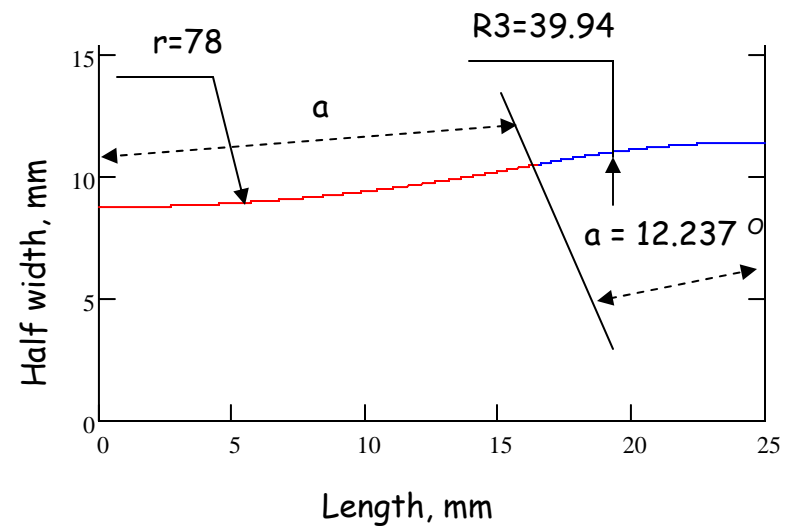
hfss

I. Syrathev, 1.07.07, CERN

Matched waveguide Taper

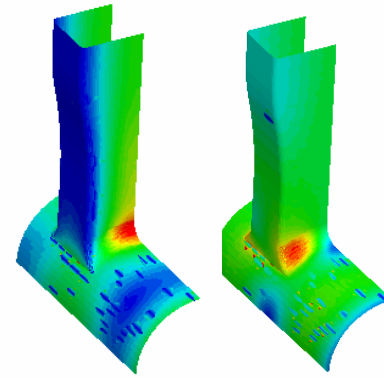
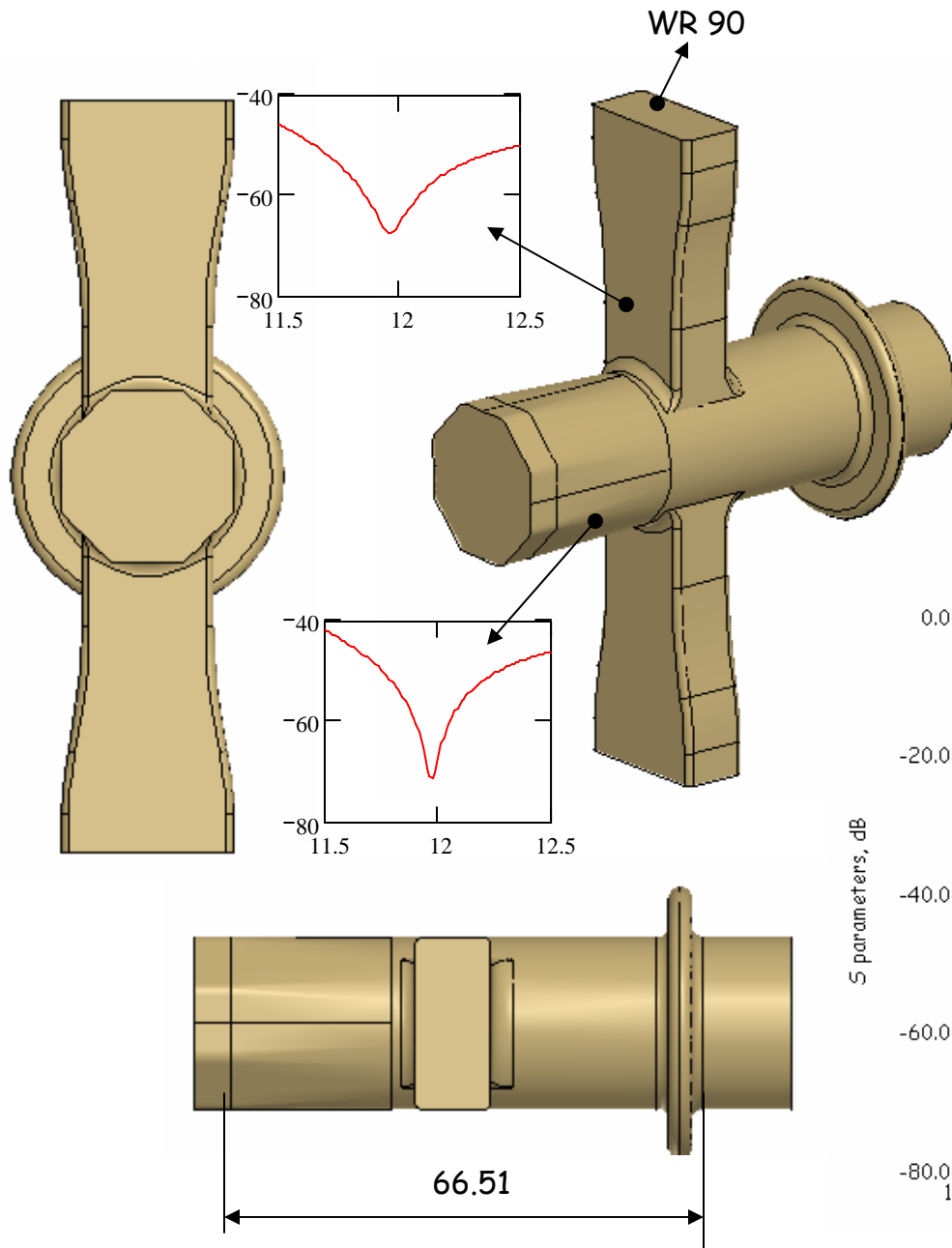


Taper profile:

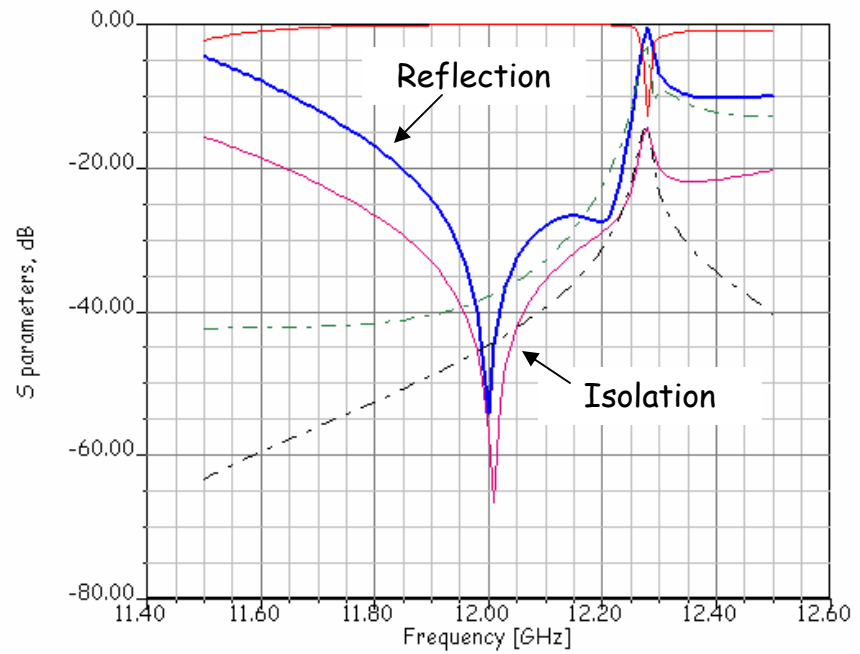


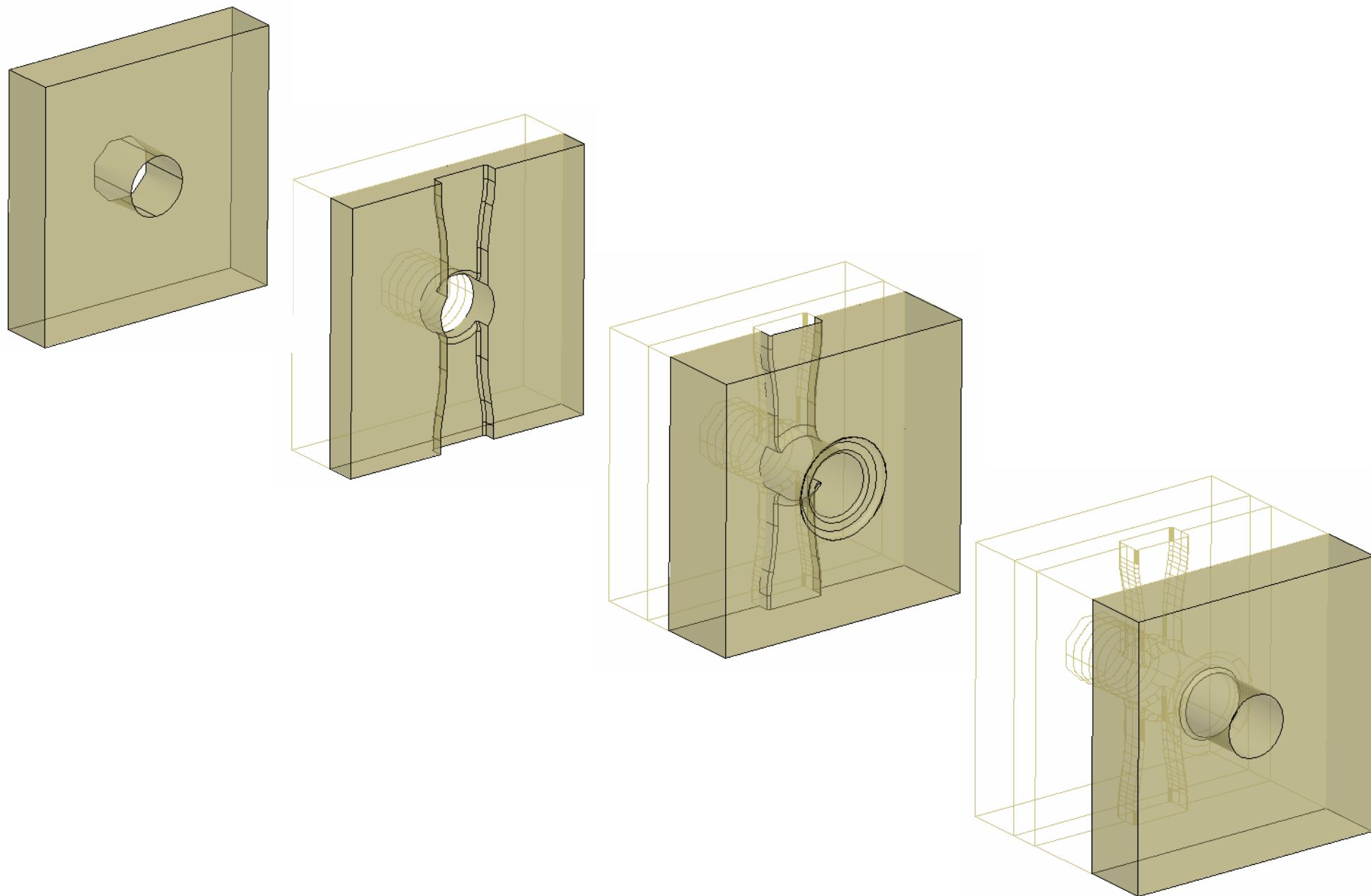
HFSS project:

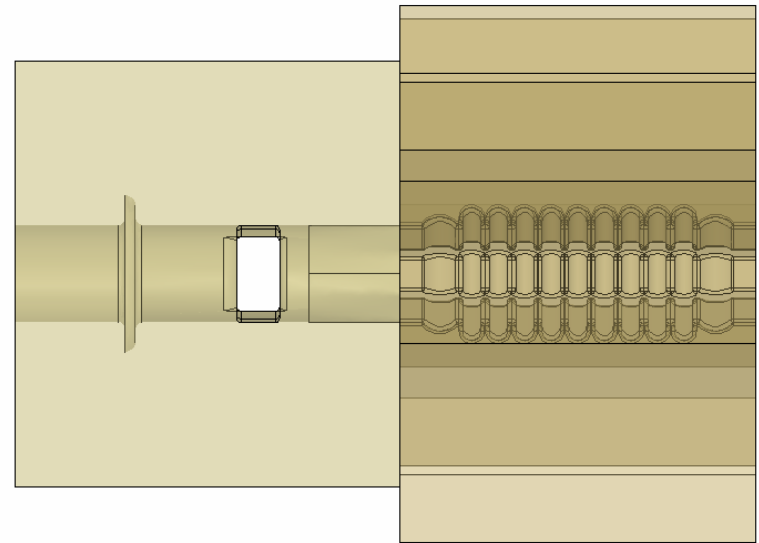
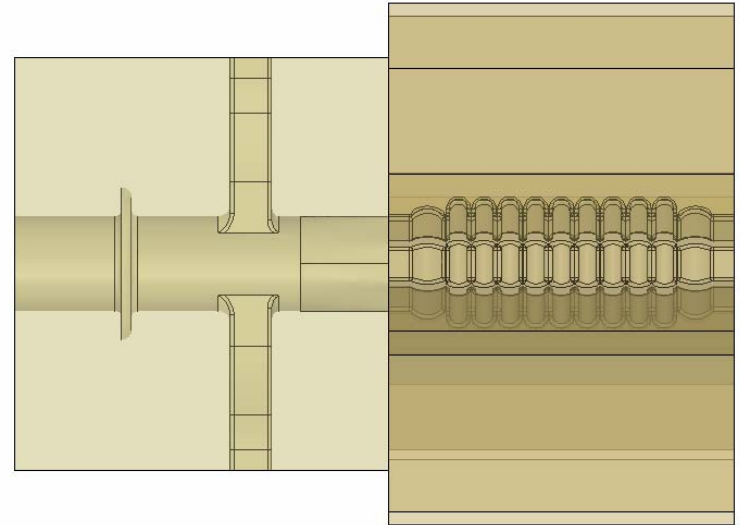
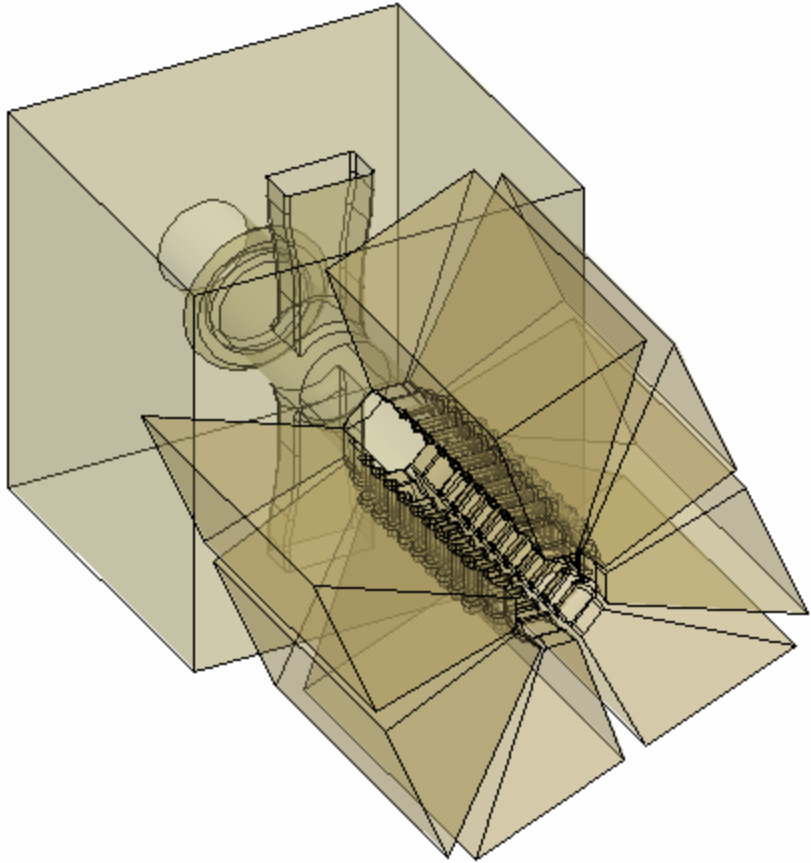
 **Taper_12_GHz** **hfss**

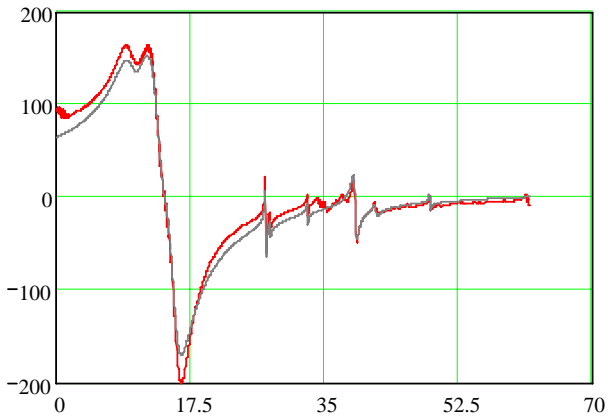
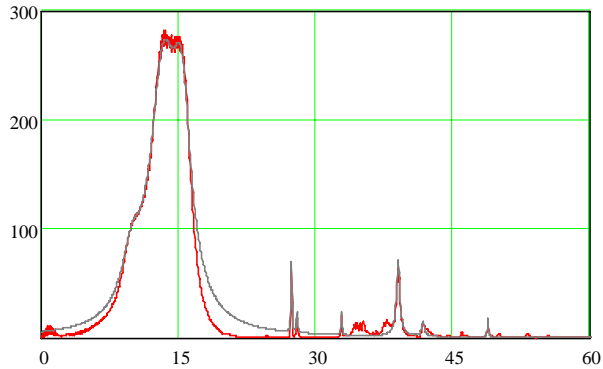
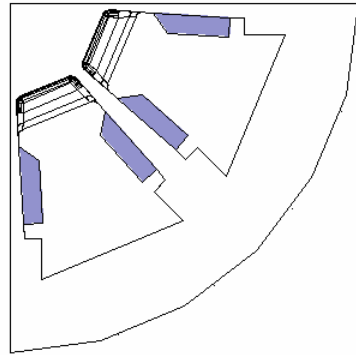
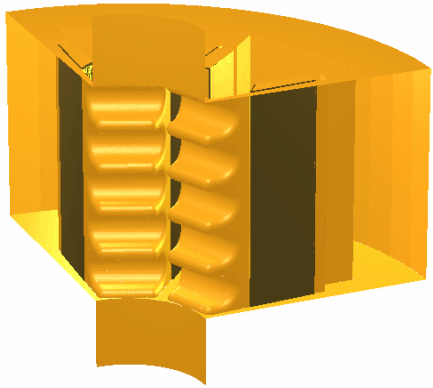


$E_{\max} (174\text{MW}) = 50 \text{ MV/m}$
 $H_{\max} (174\text{MW}) = 0.132 \text{ MA/m}$
 $\Delta T (\text{Cu}, 150\text{ns}) = 3 \text{ }^\circ\text{K}$

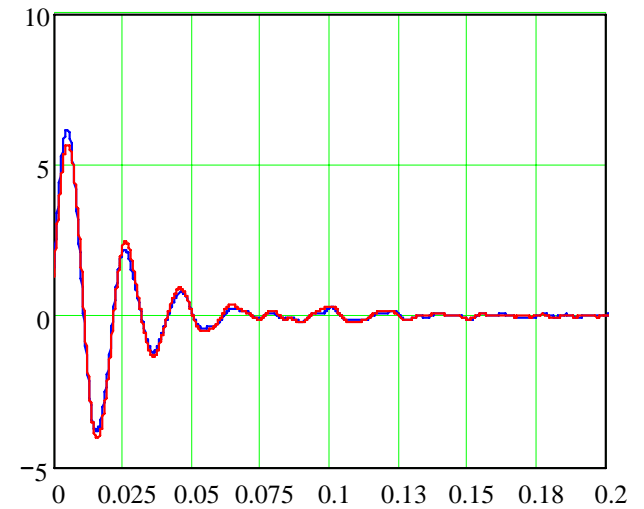
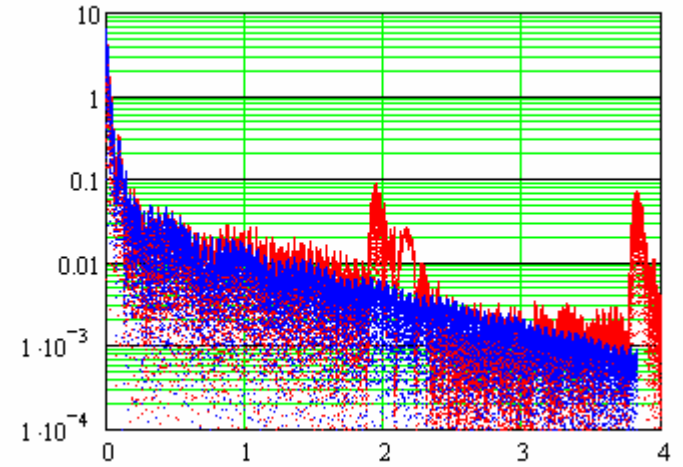




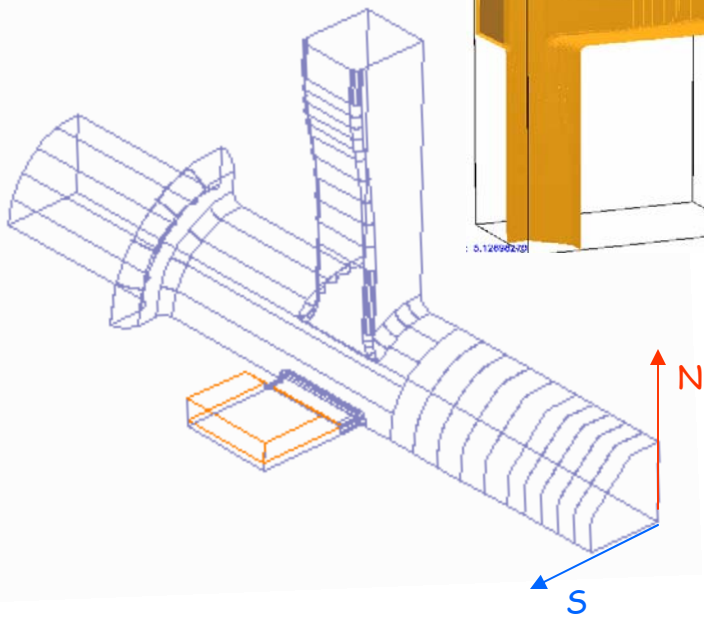
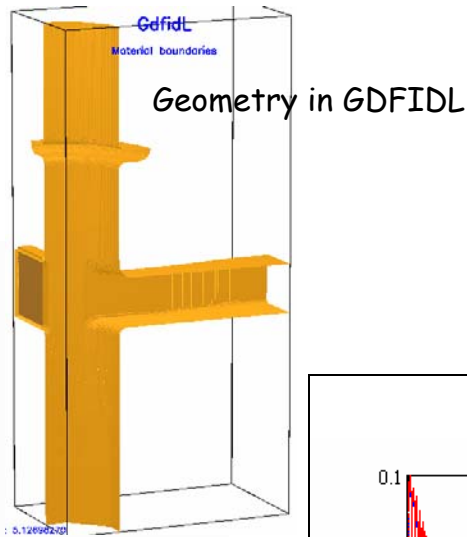




W_T	Q	F
0.045	300	27.44
0.019	180	28.05
0.017	290	32.912
0.2	85	39.12
0.03	120	41.83
0.015	380	48.91
0.85	3.7	10.0
4.82	3.8	13.4
2.63	6.2	15.46



Coupler Damping



Red color - without damping

