HOMs Study in the 500 MHz BESSY Cavity

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TECHNISCHE UNIVERSITÄT DARMSTADT

DESY-TEMF Meeting
November 28, 2019
DESY, Hamburg

Outline

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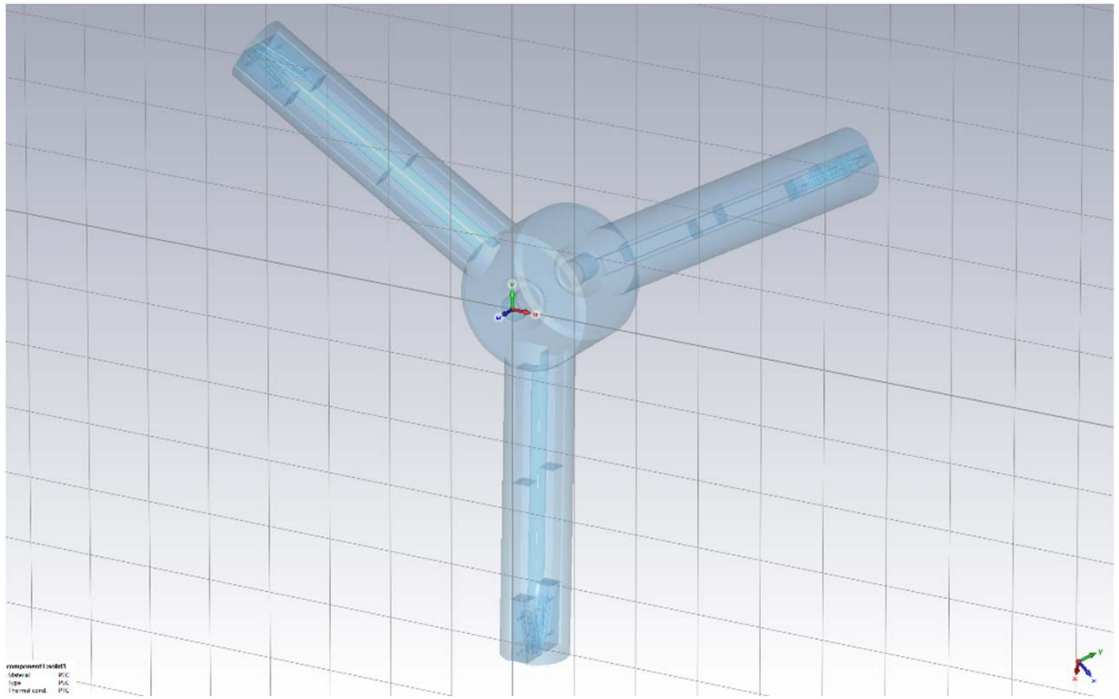
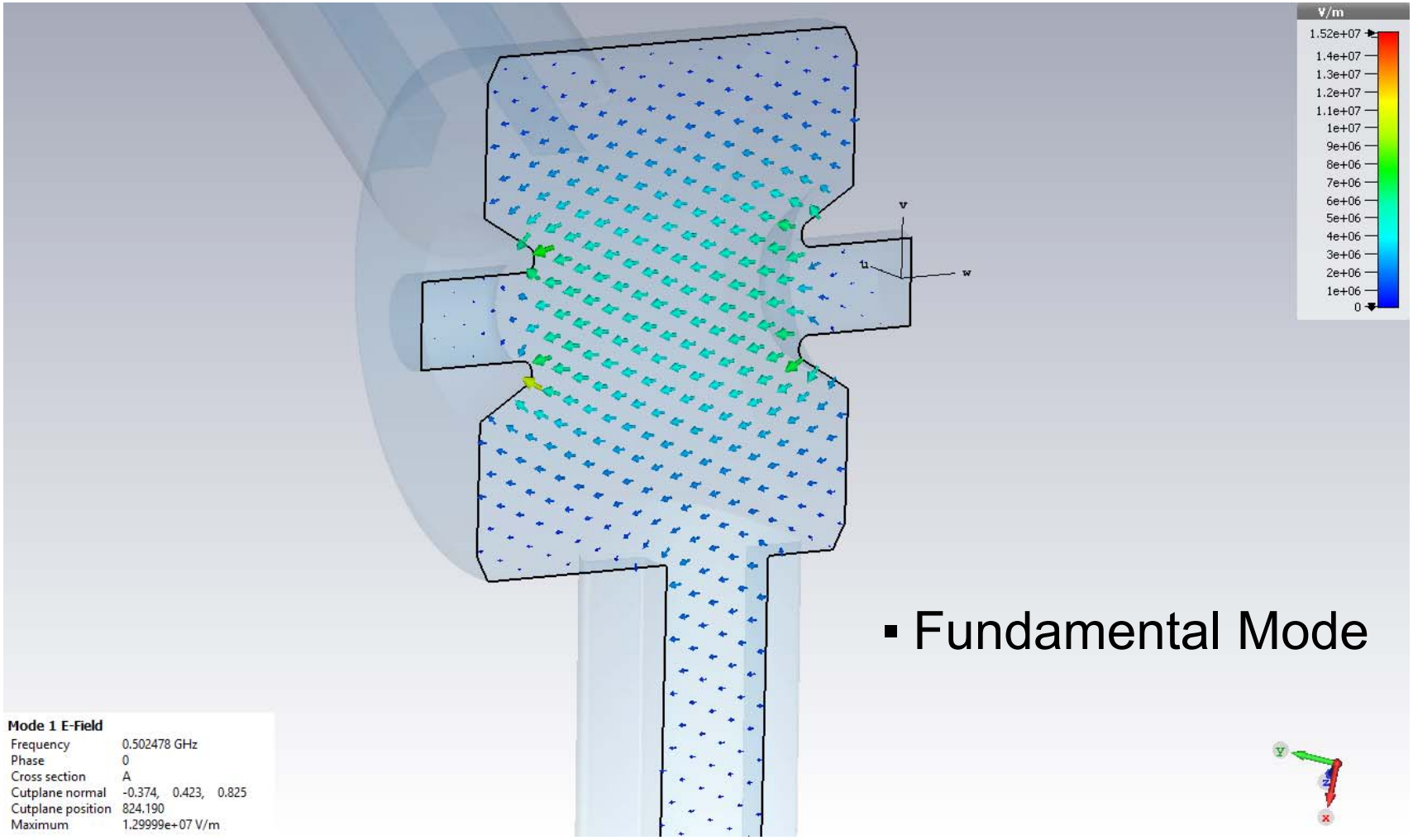
- BESSY Cavity:
- Calculation of quality factors and impedances

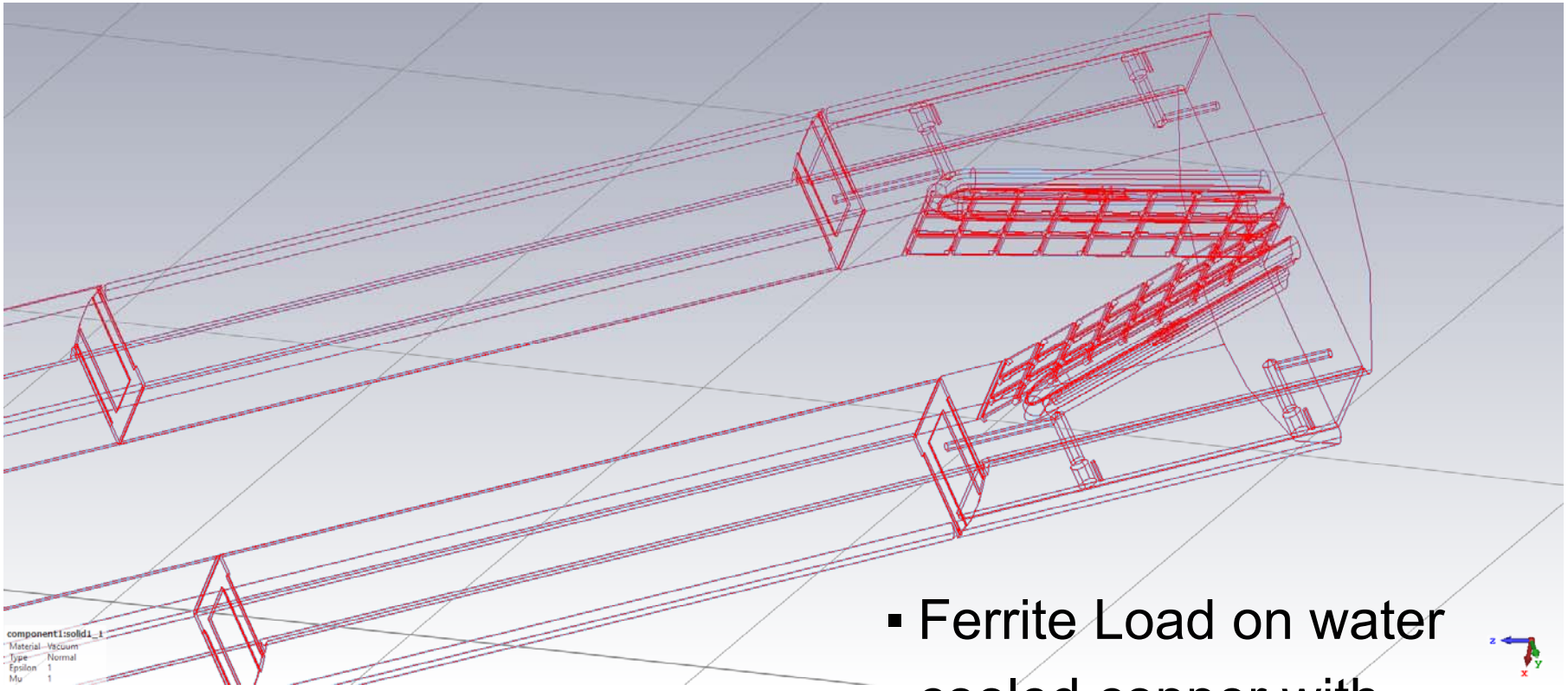


BESSY Cavity (500 MHz)



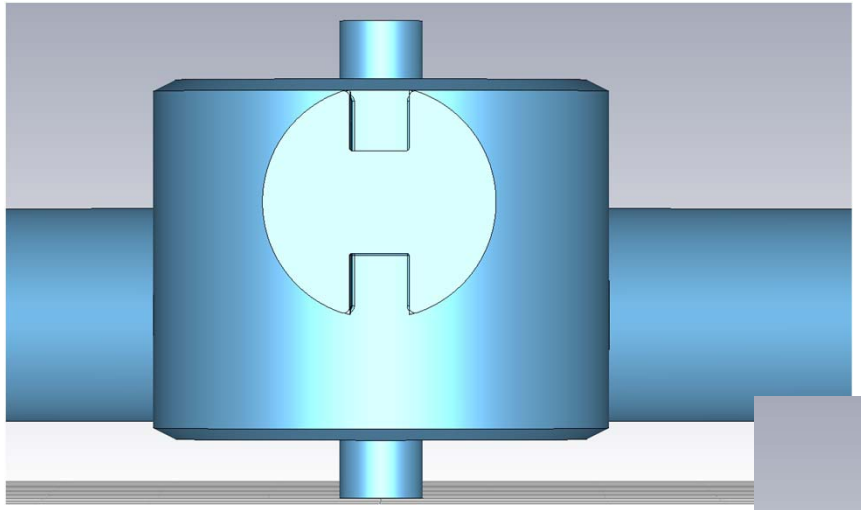
- Fundamental Mode

Ferrite Damper

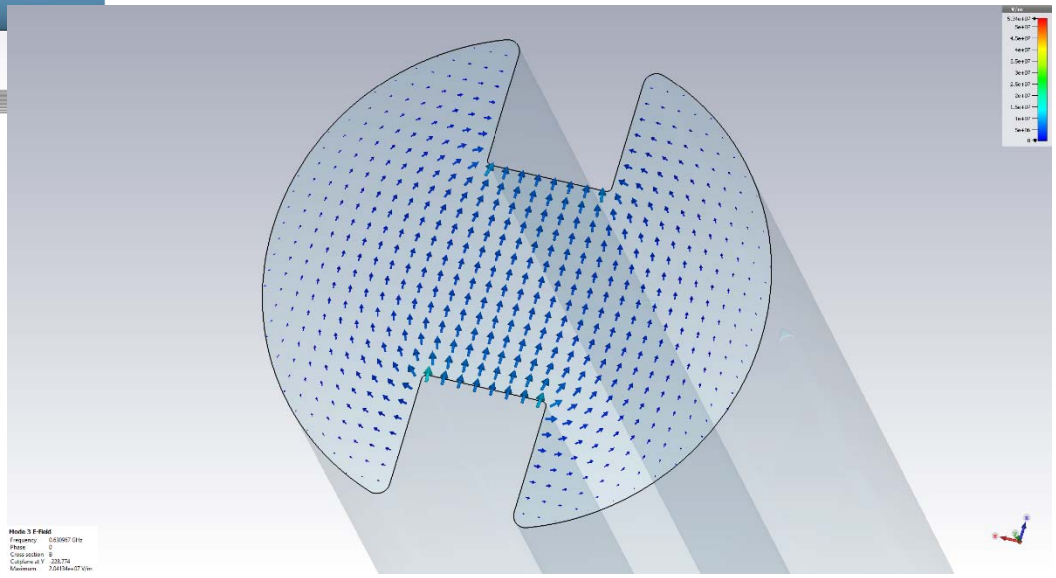


- Ferrite Load on water cooled copper with Reflection below 20%

HOM Damping Wave Guides



- Dampers Replaced by Single Mode Wave Guide Port



Complex Eigenvalues

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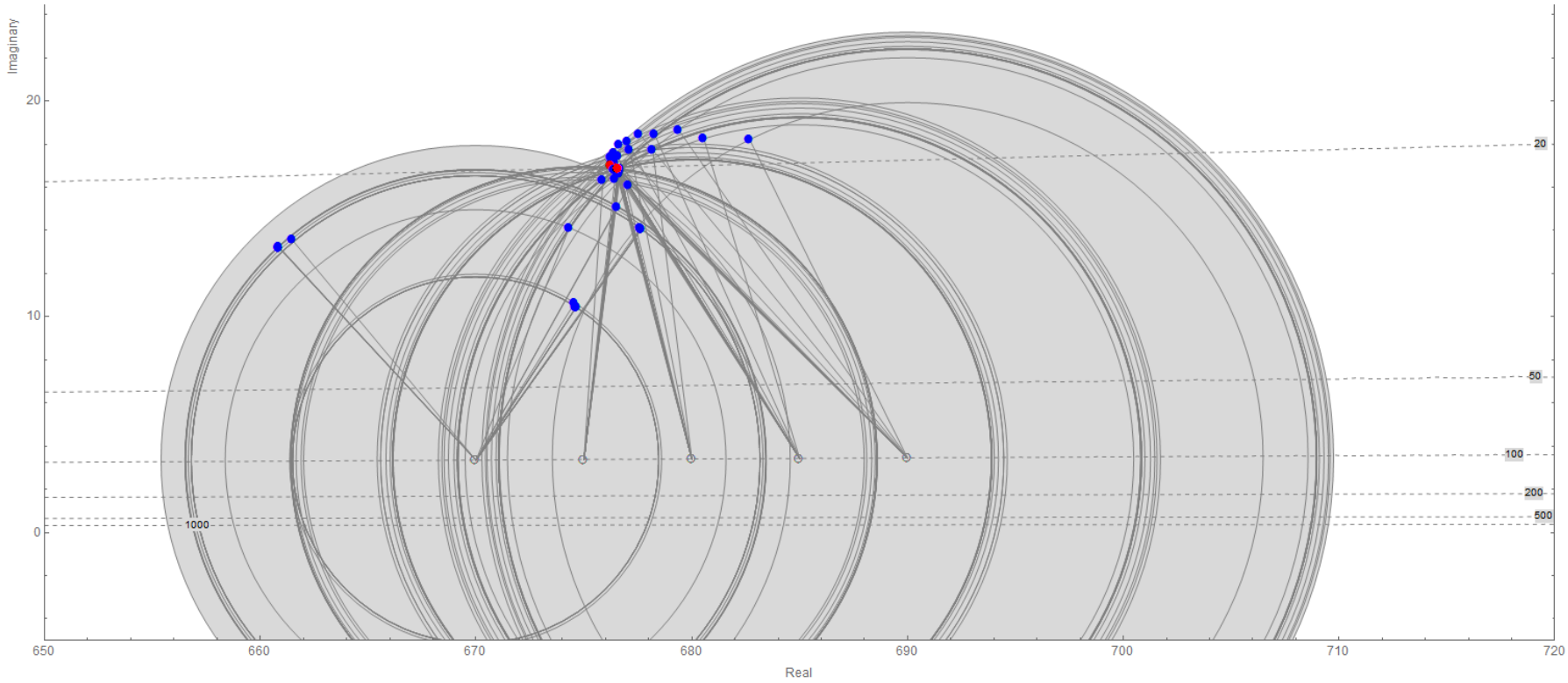
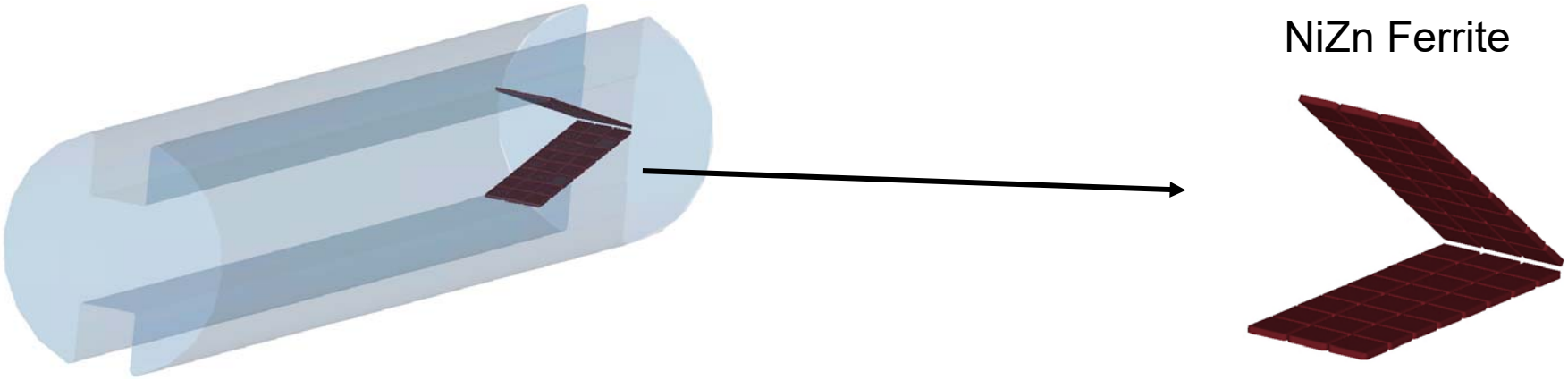
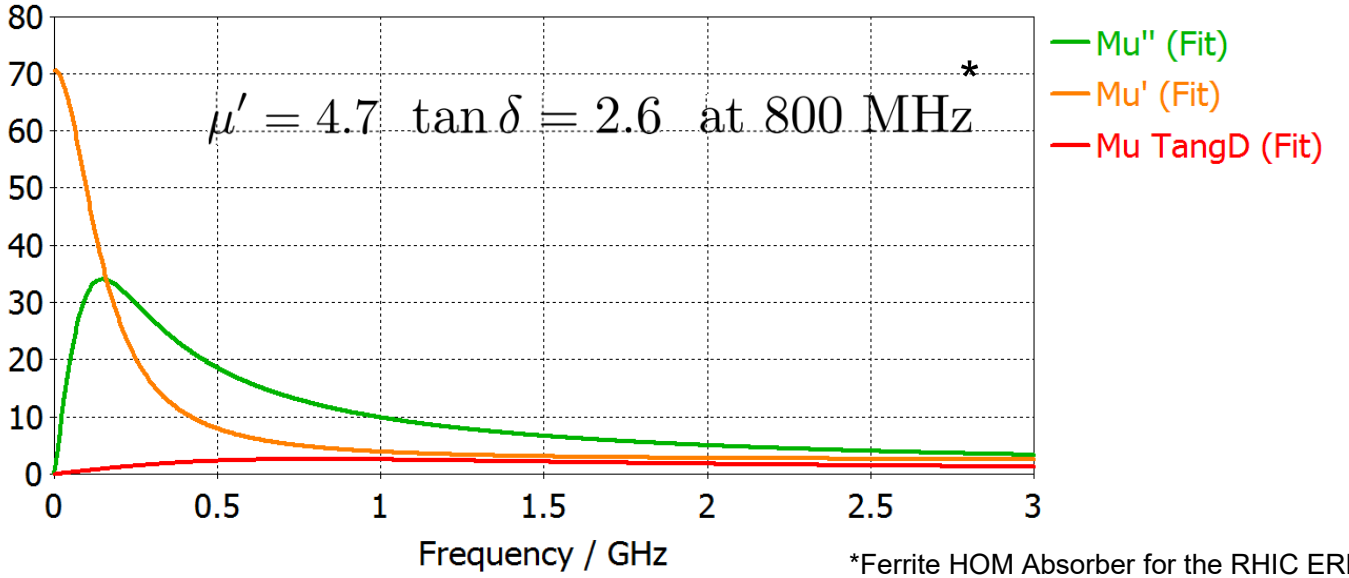
- Slow Convergence For Low-Q Modes:



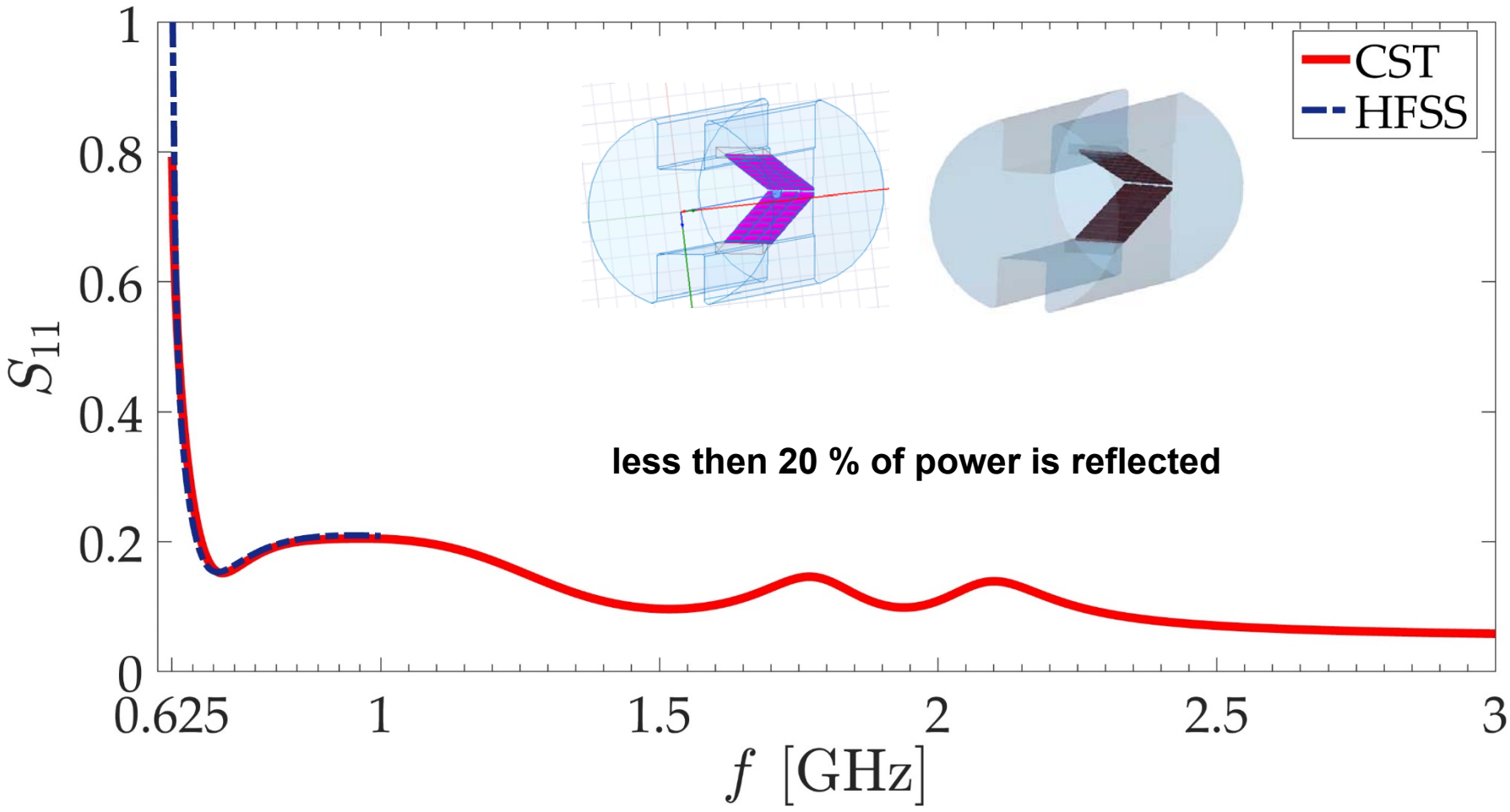
Waveguide and Ferrite Load



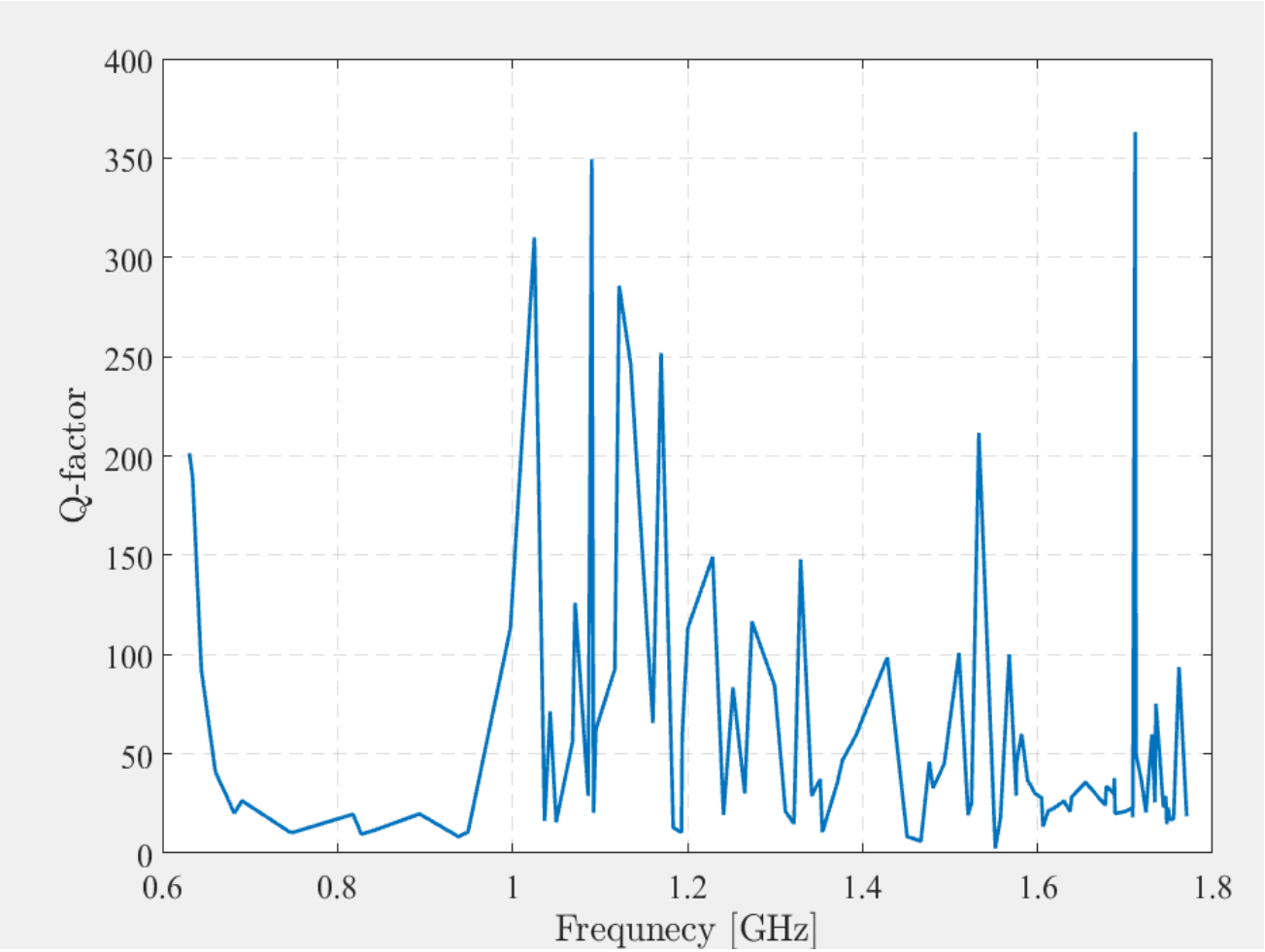


*Ferrite HOM Absorber for the RHIC ERL *H. Hahn, et, al.*

Waveguide and Ferrite Load Reflection Coefficient

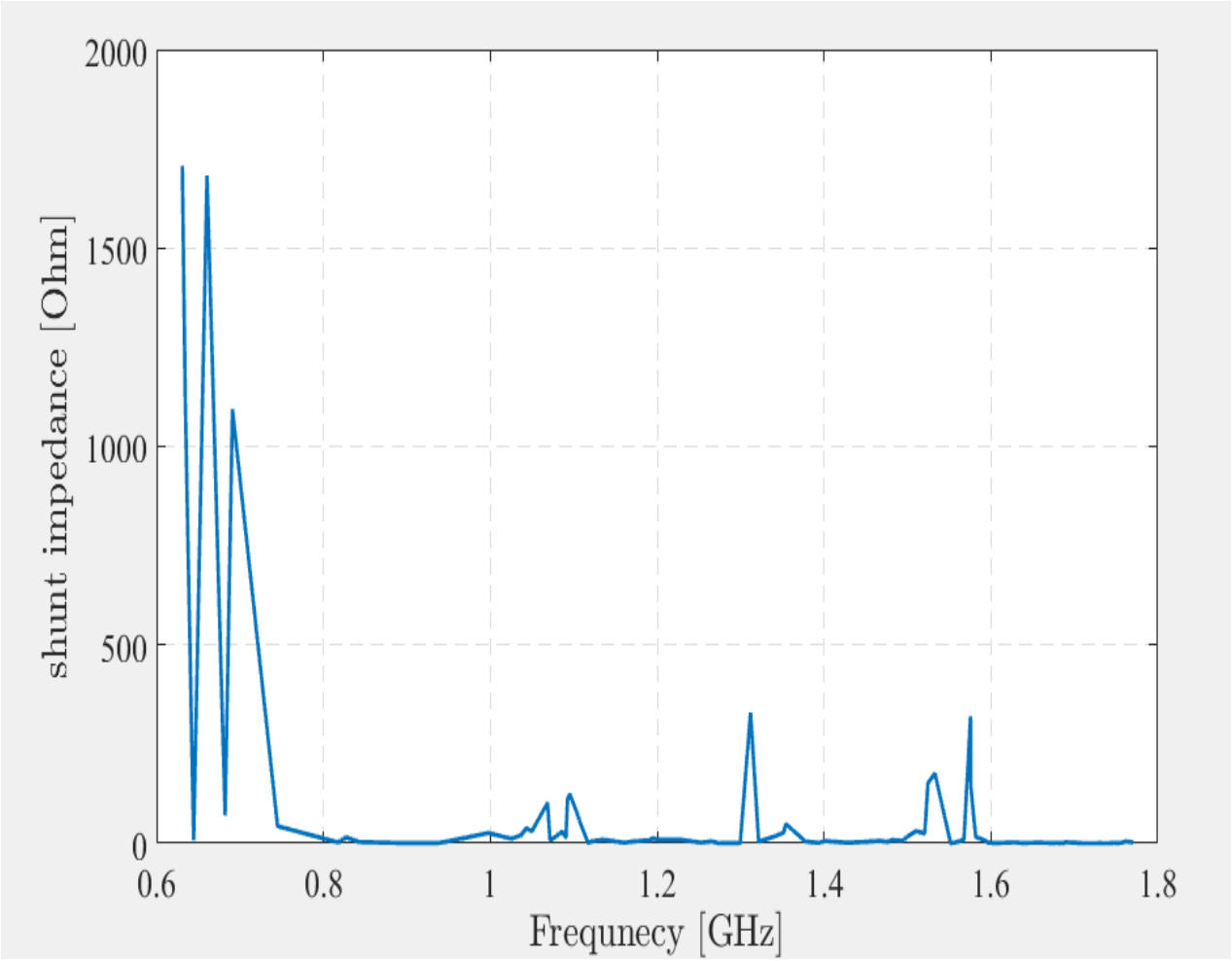


Results: Quality Factor



Frequency [GHz]	Quality Factor
0.630915	201.36
0.634549	189.16
0.644503	92.53
0.997628	113.17
1.025146	310.14
1.090635	349.38
1.121953	285.65
1.135067	246.37
1.200420	113.45
1.228747	149.10
1.273658	116.65
1.329294	147.89
1.428353	98.566
1.510238	100.85
1.532912	211.68
1.567633	100.16
1.711571	363.26
1.761638	93.71

Results: Impedances



Frequency [GHz]	Long. Shunt Impedance [Ω]
0.630915	1707.38
0.634550	1103.61
0.660549	1682.56
0.691010	1093.50
1.311916	329.59
1.520646	24.81
1.524531	151.42
1.532912	175.68
1.575641	320.08
1.575936	141.04

1.577 GHz Transverse Mode

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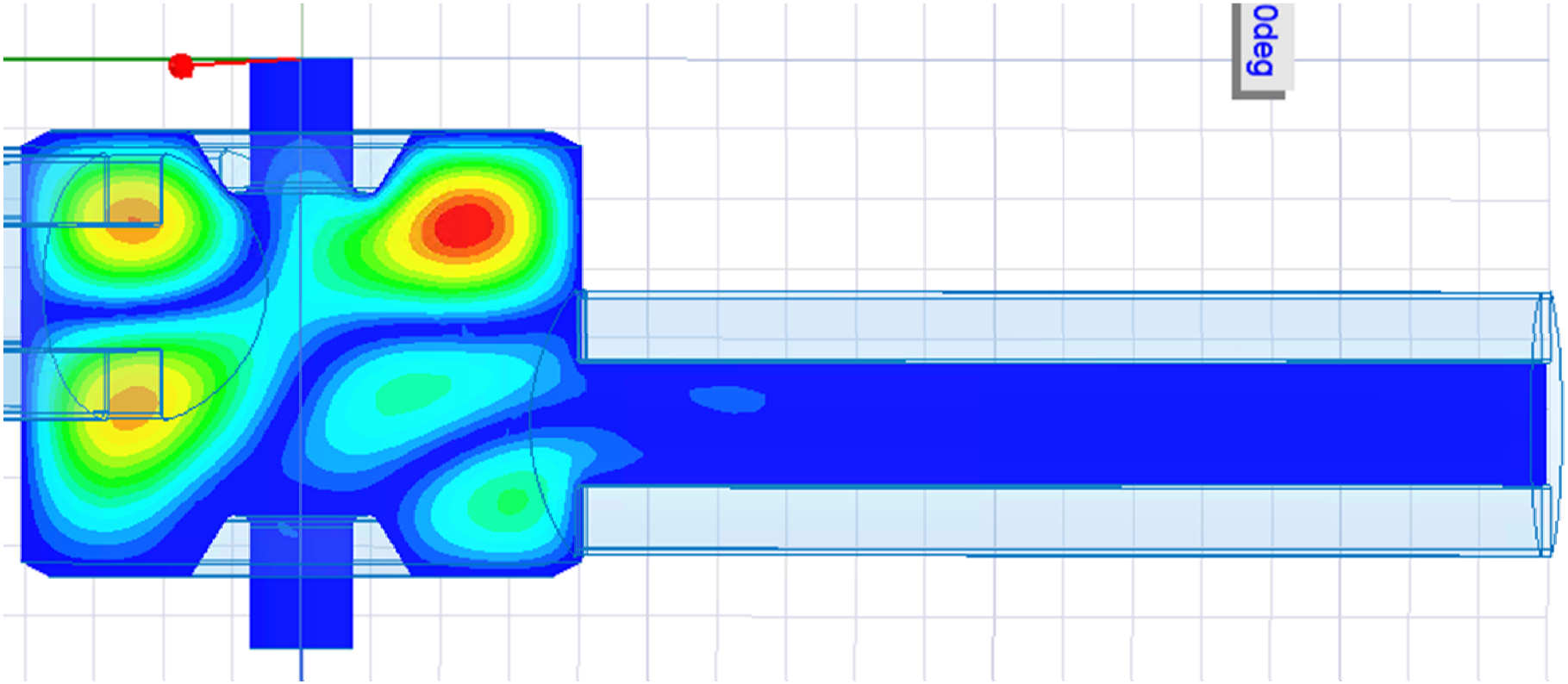
Electric field amplitude



f = 1.577 GHz, Q = 1500