Analysis of a Prolate-Spheroidal and Coaxial Microwave Chamber having Possible use for NDT Characterization of Materials and Allowing Measurement of a Toroidal Test Sample

a Finite Element Analysis (FEA)using flexPDE

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A spherical and coaxial microwave chamber containing a toroidal test sample is analyzed for the purpose of obtaining a better understanding of the nature and structure of the internal fields.

Within the evacuated test chamber is a test sample region where the conductivity is .001 Siemens/meter and the relative permittivity is 12.

This value of conductivity is that of a semiconductor or weakly conducting electrolyte solution. The relative permittivity is that of intrinsic silicon

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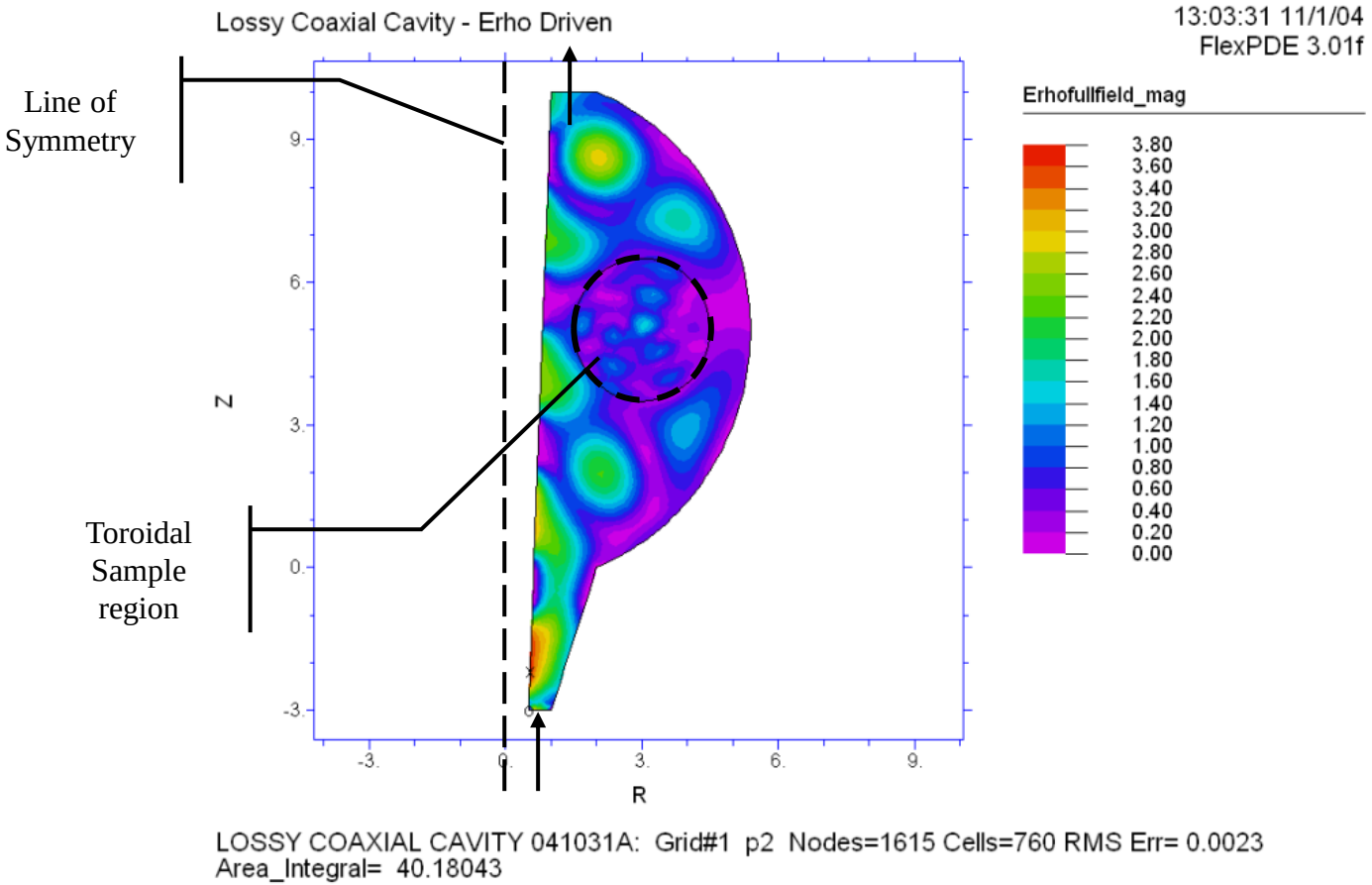

E Field Magnitude

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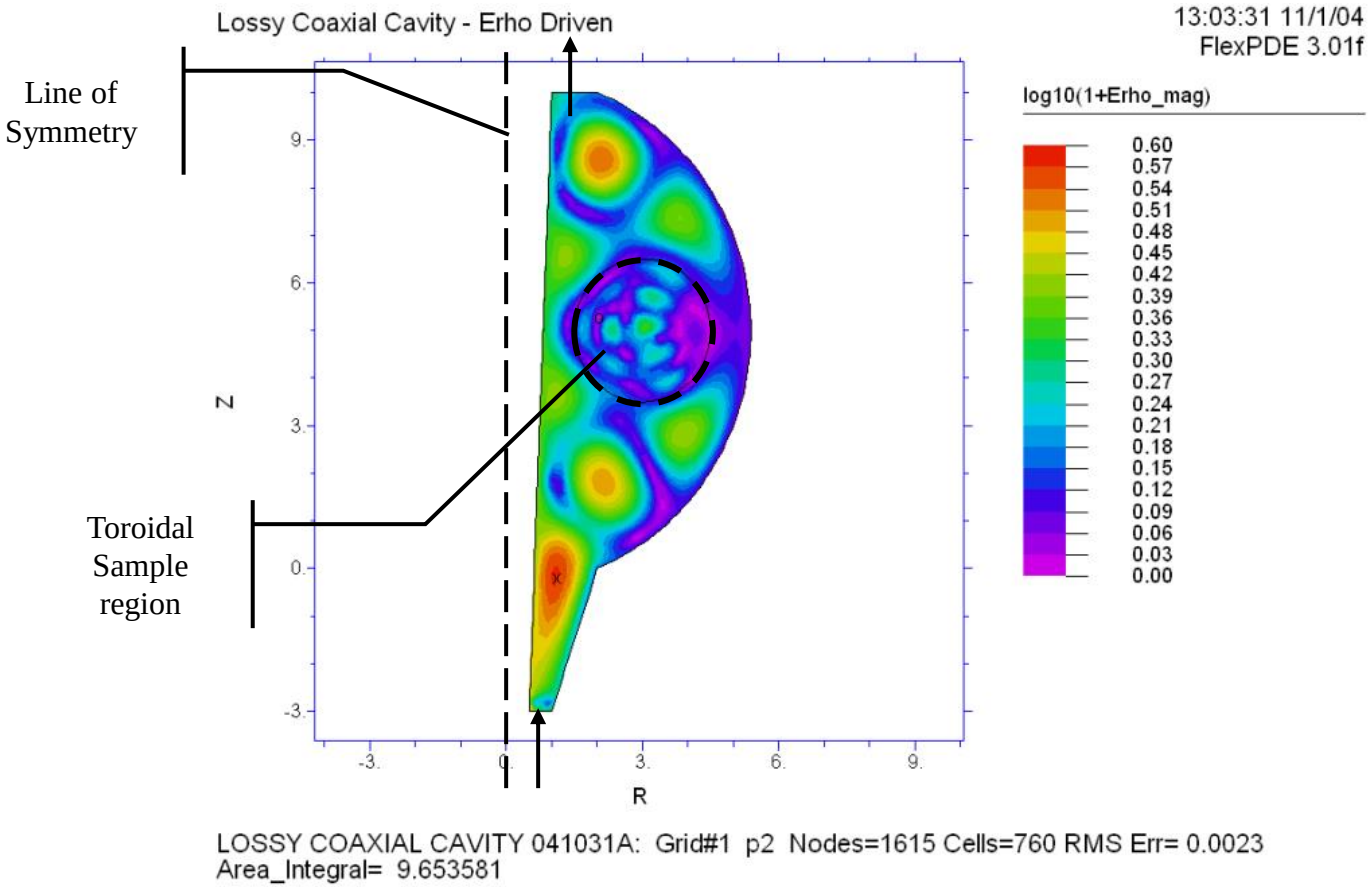

E Field Magnitude – Log Plot

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Summary and Conclusions

A Prolate-Spheroidal and coaxial NDT chamber containing a toroidal test sample has been analyzed by means of the finite element method (FEA).

The results show the effect of material conductivity on wavelength and E field amplitude within the coaxial chambers.

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