



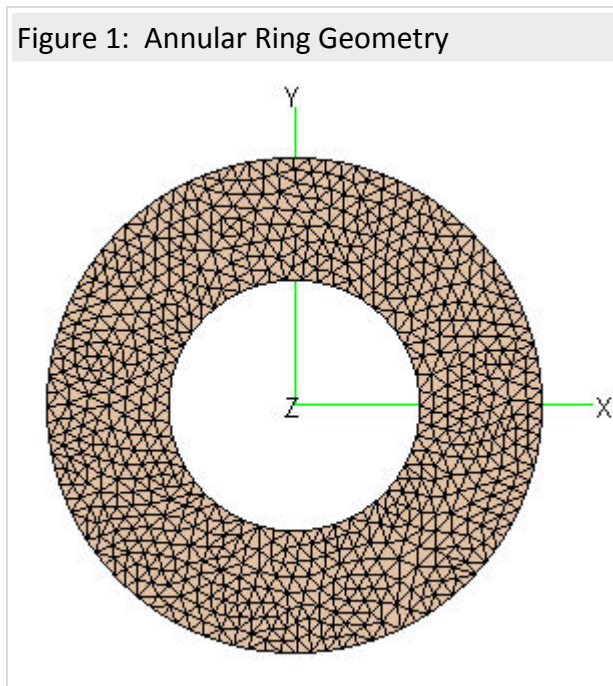
Annular Ring Microstrip Antenna Characterization

An annular ring antenna from open literature is simulated and compared with the published results.

Model Geometry

This article presents the FEKO simulation of an annular ring example from [1]. Figure 1 depicts the geometry from [1, Fig. 2b] with the following dimension:

- Ring inner diameter = 27.44 mm.
- Ring outer diameter = 53.99 mm.
- Coaxial probe feed at coordinates $(x, y) = (-20.357, 0)$ mm.
- Feed pin diameter = 0.5 mm.



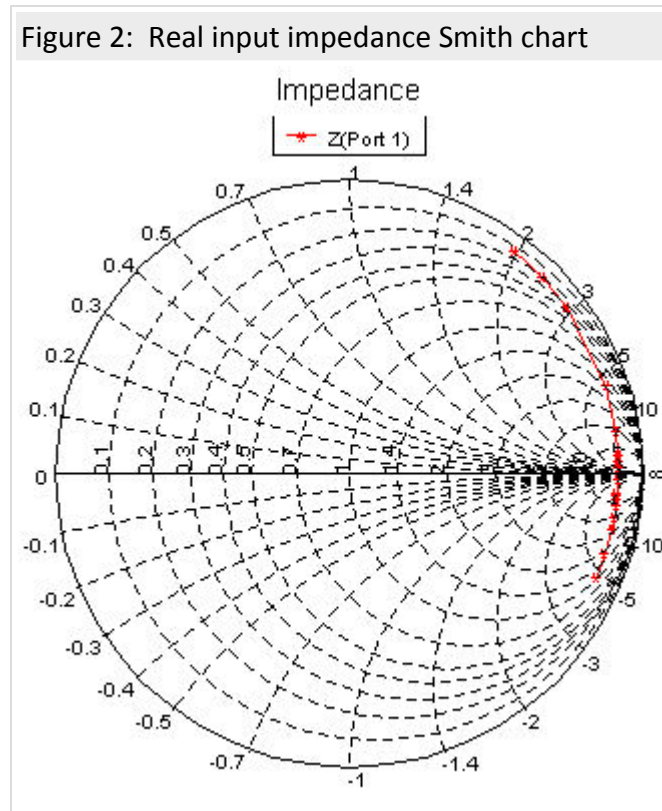
A single dielectric layer is used:

- $\epsilon_r = 2.5$
- $\tan \delta = 0.0018$
- $h = 1.52$ mm

The dielectric layer is implemented with a special Green's function as an infinite layer with a ground plane below the annular ring.

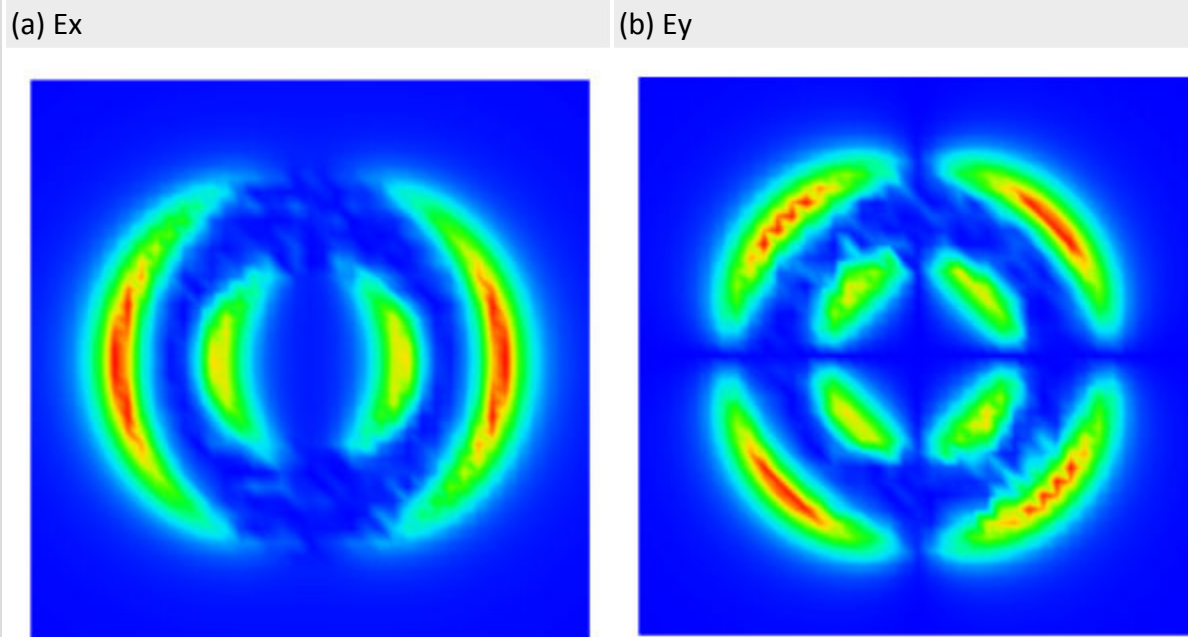
Simulation Results

A frequency sweep was performed from 1.524 GHz to 1.6040 GHz and the real input impedance computed and plotted on the Smith chart presented in Figure 2. The impedance locus crossed the real axis between 1.582 GHz and 1.584 GHz.



A near field plane was computed 2 mm above the annulus. The resulting patterns are presented in Figure 3. The results compare favorably with the results published in [1, Figure 4 and 6].

Figure 3: Tangential near fields 2 mm above the annulus



The observation plane is located 2 mm above the dielectric, with sample points at $x = y = (-40:2:40)$ mm.

- [1] S.A. Bokhari, J.-F. Zurcher, J. R. Mosig, and F. E. Gardiol, "Near fields of microstrip antennas," IEEE Trans. on Antennas and Propagation, vol 43, pp 188 - 197, Feb. 1995