

# Conformal Multi-Band Patch Antenna

## Simulating the Planar and Curved Antennas in FEKO

Recent trends in the communications industry demand evermore compact antennas that exhibit wide-band or multi-band behaviour. In some cases conformity to a specific shape is also required (e.g. to improve aerodynamics, to decrease visibility). Compact patch antennas can be designed for multi-band operation and are easily conformed to a curved surface. As shown in [1] the impedance match frequency behaviour is relatively unchanged by conforming the antenna to a curved surface and this makes the conformal multi-band patch antenna a well-suited solution.

Figure 1 shows the model for the conformal patch antenna created in CADFEKO. Here the antenna is conformed to a sphere of radius 125mm.

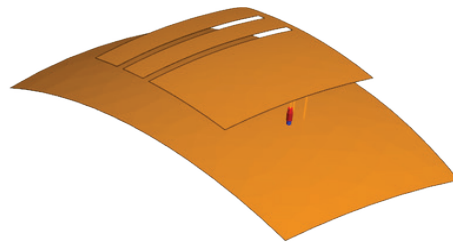


Figure 1: Conformal patch antenna simulation model

A planar multi-band patch antenna was simulated as reference (using both a meshed ground and an infinite ground plane approximation) and the conformal antenna was simulated for two different sphere radii, 250mm and 125mm. The impedance match results are shown in Figure 2.

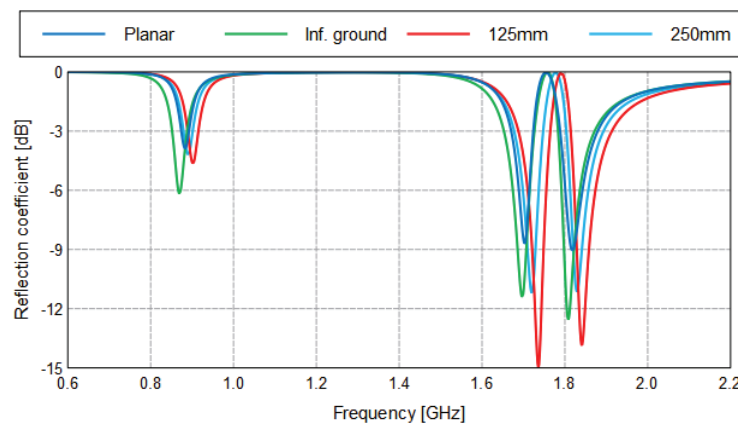


Figure 2: Reflection coefficient of all variations of the conformal antenna

As seen in Figure 2 the operating frequencies for the antenna are relatively unchanged as the antenna is conformed to different spherical surfaces.

## References

- [1] B.R. Piper, M.E. Bialkowski, "Electromagnetic Modeling of Conformal Wideband and Multi-Band Patch Antennas by Bridging a Solid-Object Modeler with MoM software", IEEE Antennas and Propagation Magazine, Vol. 46, No. 5, October 2004.