

Measurements and analysis of a probe-fed circularly polarized loop antenna printed on a layered dielectric sphere

Abstract

Radiation characteristics of a probe-fed open circular loop antenna are presented when the antenna is printed on a layered dielectric sphere. A smaller parasitic circular loop has been incorporated in the configuration to enhance the circular polarization (CP) bandwidth. The structure has been analyzed rigorously using the method of moments (MoM), where the sphere has been represented using the spherical dyadic Green's function (DGF). The computation efficiency has been enhanced using asymptotic extraction as well as closed form integrations to compute the MoM impedance matrix elements. The computed results are in close agreement with those obtained from measurements.

Keywords

Circular polarization; Dyadic Green's function; Loop antennas; Moment method; Spherical antennas