عنوان مقاله:

Physical Optics Calculation of Electromagnetic Scattering From Haack Series Nose Cone

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خلاصه مقاله:

In this paper, the physical optics method is used to study the problem of electromagnetic scattering from Haack series nose cone. First, a meshing scheme is introduced which approximates the curvature of the surface by piecewise linear functions in both axial and rotational directions. This results in planar quadrilateral patches and enables efficient determination of the illuminated region and application of closed-form expression for computing physical optics integral. Then the ray-surface intersections are obtained using the implicit surface equation of Haack series nose cone. The equation obtained by the intersection test does not have analytical solution. Hence, the Steffensen s method is applied to solve this equation numerically. To find the initial point for Steffensen method s iterations, a bounding cylinder is used. It provides high precision evaluation of initial point, fast convergence and short computation time. Moreover, if the ray does not intersect the bounding volume, it certainly misses the bounded object and hence does not need to be tested in the Steffensen s method. The ray-cylinder intersection test has a simple analytical .solution, which results in fast rejection of missed rays

کلمات کلیدی:

Bounding volume, Haack series, intersection test, mesh generation, physical optics