

各向异性材料涂覆目标电磁散射特性仿真

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Simulation of the Electromagnetic Scattering for Target Coated with Anisotropic Materials

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摘要

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摘要 该文基于阻抗边界条件(IBC), 提出了3维各向异性材料涂覆目标电磁散射特性的矩量法(MoM)解决方案。根据表面等效原理, 采用感应电流流以3维RWG(Rao-Wilton-Glisson)矢量基函数展开的伽略金法。以表面阻抗矩阵表征电磁参数, 实现各向异性材料涂覆目标的电磁仿真, 算例结果与Mie级数解等精确结果吻合良好。对各向异性材料涂覆复杂目标的电磁散射特性进行分析, 为目标的雷达隐身和反隐身提供理论支持。

关键词: 电磁散射 各向异性 阻抗边界条件 RWG (Rao-Wilton-Glisson)

Abstract: The Method of Moments (MoM) based on Impedance Boundary Condition (IBC) is presented to analyze the electromagnetic scattering characteristics of three-dimensional target coated with anisotropic materials. According to the surface equivalence principle, Galerkin method is used with electric or magnetic current expanded by three-dimensional Rao-Wilton-Glisson (RWG) vector basis functions. The electromagnetic simulation of target coated with anisotropic materials is performed with the electromagnetic parameters characterized by the surface impedance matrix, while the numerical results agree well with the exact results such as Mie series solution. Analyses for the electromagnetic scattering properties of complex targets coated with anisotropic materials are presented, which provide theoretical support for the radar stealth and anti-stealth.

Keywords: Electromagnetic scattering Anisotropic Impedance Boundary Condition (IBC) Rao-Wilton- Glisson (RWG)

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