

Spherical Harmonic Based Monostatic Anisotropic Point Scatterer Model for RADAR Applications

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Abstract : High performance computing (HPC) based emulators can be used to model the scattering from multiple stationary and moving targets for RADAR applications. These emulators rely on the RADAR Cross Section (RCS) of the targets being available in complex scenarios. Representing the RCS using tables generated from electromagnetic (EM) simulations is often times cumbersome leading to large storage requirement. This paper proposed a spherical harmonic based anisotropic scatterer model to represent the RCS of complex targets. The problem of finding the locations and reflection profiles of all scatterers can be formulated as a linear least square problem with a special sparsity constraint. This paper solves this problem using a modified Orthogonal Matching Pursuit algorithm. The results show that the spherical harmonic based scatterer model can effectively represent the RCS data of complex targets.

Keywords : RADAR, RCS, high performance computing, point scatterer model

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