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海面与其上方二维目标的复合电磁散射

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摘要 提出了一种求解一维海面与其上方二维目标复合电磁散射场的混合方法，在矩量法的基础上利用迭代加速度算法求解单纯海面的表面Kirchhoff电流及电磁散射场，再应用矩量法(MOM)求解二维目标的表面电流及散射场．根据得到的表面电流及散射场，结合互易性定理求解了二维柱体同海面之间的二次耦合散射场．该混合方法仅在目标上应用MOM，所产生的矩阵维数远远小于用经典MOM计算该复合散射问题所产生的矩阵，减少了计算量．数值结果同经典MOM方法结果比较，验证了其准确性，并且计算时间仅为MOM法的12%左右．

关键词 电磁散射 迭代加速方法 互易性原理

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Investigation on the electromagnetic scattering interaction between the sea surface and the two-dimensional target above it

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Abstract

A hybrid method is proposed for the analysis of compound scattered fields between the sea surface and a 2-D target. The Kirchhoff current and scattered field of the rough sea surface are evaluated by using the MOMI (Method of Ordered Multiple Interactions), the polarization current on the target and the scattered field are given by MOM. Associating with the reciprocity theorem, the second-order coupling scattered fields between the rough sea surface and a 2-D cylinder above it are calculated. The size of the system of linear equations produced by the hybrid method becomes much smaller than that by the conventional MOM, so the hybrid method saves the computer memory and reduces the computation time. Numerical results show the validity of the hybrid method and the computational time of our method is only about 12% that by MOM.

Key words electromagnetic scattering method of ordered multiple interactions reciprocity theorem

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