2004 Vol.42 No.3 pp.413-418 DOI:

Electromagnetic Scattering from One-Dimensional Time-Varying Sea Surface with Gaussian-Like Beam Incidence

GUO Li-Xin,[1] WU Chun-Yu,[1] Kim Cheyoung,[2] and WU Zhen-Sen[1]

[1] School of Science, Xidian University, Xi'an 710071, China

[2] School of Electrical Engineering and Computer Science, Kyungpook National University, Taegu, Korea

(Received: 2003-11-4; Revised: 2004-1-12)

Abstract: A widely used iterative technique named the Method of Ordered Multiple Interactions is given for calculating the Gaussian-like beam scattering from a time-varying sea surface with the Pierson-Moskowitz (P-M) spectrum. This is done by solving the magnetic field integral equation for the current induced on an infinite rough surface. Following the discretization of the integral equation, the unknown currents can be determined more rapidly with the LU decomposition. Numerical results are presented with emphasis on the electromagnetic backscattering at low grazing angle incidence. It is shown that the backscattering cross section is proportional to the nearly fourth power of the grazing angle for the plane and beam incidence. This is consistent with the result given in some references. The angular distributions of the backscattering cross section with a different beam waist, surface length, and velocity of the wind are discussed.

PACS: 41.20.-q, 42.25.Fx,
Key words: time-varying sea surfaces, electromagnetic scattering, Gaussian-like beam

[Full text: PDF]

Close