

论文

动态分形粗糙海面散射的遮蔽效应和多普勒谱研究

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摘要

利用粗糙面电磁散射中的基尔霍夫近似, 结合粗糙面遮蔽函数和分形粗糙海面特征函数的计算, 导出了考虑遮蔽效应情况下导体分形粗糙海面散射截面的近似公式。研究了海面不同均方根斜率对遮蔽效应的影响。比较了毫米波入射时高斯粗糙面和分形粗糙海面的散射截面分布情况。分析了不同分维下分形海面双站散射截面的角分布情况。详细讨论了不同入射角和不同分维及遮蔽效应对分形海面散射回波多普勒谱的影响。

关键词 [分形粗糙海面](#) [电磁散射](#) [遮蔽效应](#) [多普勒谱](#)

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Study on the Shadowing Effect and Doppler Spectra for the Scattering from the Time-Varying Fractal Rough Sea Surface

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Abstract

According to the Kirchhoff approximation for the rough surface scattering and by calculating the shadowing function and characteristic function of the fractal rough sea surface, the formula of the scattering cross section for the conducting fractal sea surface is derived with consideration of the shadowing effect. The influence of the shadowing effect for different RMS slope of the surface is investigated. The distribution of the scattering cross-section for the Gaussian rough surface and fractal rough sea surface is compared with millimeter wave incidence. The angular distribution of the bistatic scattering cross-section from fractal sea surface for different fractal dimension and different spatial frequency is analyzed. The influence of different incident angle, different fractal dimension and shadowing effect on the Doppler spectra of the echo from the fractal sea surface is discussed in detail.

Key words [Fractal rough sea surface](#) [Electromagnetic scattering](#) [Shadowing effect](#) [Doppler spectra](#)

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