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of

Scalar Wave Diffraction by Perfectly Soft Thin Circular Cylinder of Finite Length; Analytical Regularization Method

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Abstract: A new mathematically rigorous and numerically effective method for solving the boundary value problem of scalar wave diffraction by an infinitely thin circular cylindrical screen of finite length is proposed. The method is based on the combination of the Orthogonal Polynomials Approach, and on the ideas of the methods of analytical regularization. As a result of the suggested regularization procedure, the initial boundary value problem is equivalently reduced to the infinite system of the linear algebraic equations of the second kind, i.e. to an equation of the type $(I + H)x = b$ in the space ℓ_2 of square summable sequences. This equation can be solved numerically by means of truncation with, in principle, any required accuracy.

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