45. Wiener-Hopf Integral Equation Model: Underwater Applications

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The objective of this research project is to find a numerical solution to the Neumann boundary value problem for the Wiener-Hopf Integral Equation Model. The Wiener-Hopf Integral Equation has applications in radiative transfer, electromagnetics, and optical oceanography. The mathematical model of this integral equation will yield convergence results of incoming external waves over the surface of spherical shapes that satisfy Greens Theorem. The modeling of these shapes will be done using the Galerkin method, a type of numerical approximation using the Gaussian Quadrature nodes. Inspired by the loss of Malaysian Airline flight 370, this study into scattering theory and optical oceanography would help provide the theoretical framework for understanding light propagation in the ocean, which can aid in the search of submerged objects.