

## **294. Detecting Underwater Objects through Scattering Theory; The Wiener-Hopf Integral Equation**

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The Galerkin method is used to numerically solve the exterior boundary value problem for the Wiener-Hopf Integral Equation over the boundary of a Spherical Biconcave Disk. The Wiener-Hopf Integral Equation is a mathematical model representing the radiative transfer over the half plane of the Spherical Biconcave Disk. The equation is used in many diffusion problems, and can be used detect objects underwater through scattering theory. The scattering process forces some forms of wave radiation to deviate from a straight trajectory and includes deviation of reflected radiation from an angle predicted by the law of reflection. We used the Green's theorem to solve the integral equation on the boundary of the surface for the Dirichlet problem. The Exterior Boundary problem will be solved using the Gaussian Quadrature Method, where rotations of the coordinates would be used to minimize the inherent singularity that is present in the fundamental solution of the equation.