

Scattering of Waves in a Two-Layered Medium with Smooth Transition
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This project involves the scattering of incident pulses propagating in a medium having a wave speed $c(x)$ with a simple smooth transition from a constant wave speed c_1 when $x = -\infty$ to a constant wave speed c_2 when $x = +\infty$. The problem involves studying the effects of the smoothness of the transition, the asymptotic ratio of wave speeds c_2/c_1 and the shape of an incident pulse on the transmission and reflection properties of scattered waves. The method to be investigated is based on a superposition of special invariant solutions arising from nonlocal symmetries of such a variable wave speed wave equation.

Background required: At least 80% in senior level Honours Physics courses, high standing in Math 300, 316 and 400 plus a background in using symmetries to solve partial differential equations.