

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

New Generalized Phase Shift Approach to Solve the Helomholtz Wave Equation SAMEERA ABEYKOON, DONALD KOURI, University of Houston — A new method for solving the acoustic scattering wave equation in order to facilitate the exploration for production of oil and gas. The approach is based on a new way to generalize the so called “one way wave equation”. Our approach makes use some very simple, standard ideas from differential equations and the non-iterative solution of the Lippmann-Schwinger equation in quantum scattering. The importance of this new approach is that it corrects the usual approximation made in the one way wave equation so that the approach is equivalent to full solution of the two way acoustic scattering problem. However, because it is formulated so as to deal with coupled first order differential equations, it makes the problem appear to be one way. The initial conditions for the coupled first order differential equations need to satisfy the boundary conditions associated with waves that can travel two ways. The problem of evanescent waves is being treated using a projection operator technique patterned after an approach of H. Feshbach in nuclear physics. We are currently testing the method for several simple two dimensional acoustic models.

Sameera Abeykoon
University of Houston

Date submitted: 02 Dec 2007

Electronic form version 1.4