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2aSAb8. Recursive Green function technique applied to acoustic wave propagation. Mauro S. Ferreira, Gerrit E. W. Bauer (Dept. of Appl. Phys., Delft Univ. of Technol., Lorentzweg 1, 2628 CJ Delft, The Netherlands), and Kees Wapenaar (Delft Univ. of Technol., 2628 RX Delft, The Netherlands)

Guided by similarities between electronic and classical waves, a numerical code based on a formalism proven to be very effective in condensed matter physics has been developed, aiming to describe the propagation of elastic waves in stratified media (e.g., seismic signals). This so-called recursive Green functions technique is frequently used to describe electronic conductance in mesoscopic systems. It follows a space discretization of the elastic wave equation in frequency domain, leading to a direct correspondence with electronic waves traveling across atomic lattice sites. An inverse Fourier transform simulates the measured acoustic response in time domain. The method is numerically stable and computationally efficient. Moreover, the main advantage of this technique is the possibility of accounting for lateral inhomogeneities in the acoustic potentials, thereby allowing the treatment of interface roughness between layers. Without those lateral variations, wave propagation across perfectly layered media with planar sources are equivalent to I-D environments, and therefore should present localization effects. Inclusion of those variations breaks the symmetry and turns the wave propagation into a truly 2-D or 3-D problem, where localization is weaker or may not occur. Numerical techniques without lateral inhomogeneities may inadvertently overestimate localization effects.