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**Range and cross-range propagation effects in a liquid wedge  
overlying an elastic bottom**

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The penetrable-wedge model, a constant density isospeed layer of fluid with a pressure-release horizontal surface and a sloping elastic bottom, provides an extensive insight into the role of the ocean bottom in acoustic propagation from an underwater source. In particular, it is a realistic model of a rock-bottom ocean near a shoreline that accounts for horizontal refraction and allows for a ground wave. This paper discusses some new results for small and large range propagation for two penetrable-wedge models: one where the shear wave speed in the bottom is lower than the sound speed in the fluid and the other where the shear wave speed is higher. The operational representation of the ray-integral solution for the acoustic field from a point source in a penetrable wedge of fluid is further developed to the stage at which one can compute the exact, other than the omission of diffraction at the wedge apex, pressure response curve, as recorded at a receiver, due to an arbitrary time variation of the pressure at the source in a  $3^\circ$  wedge. The three-dimensional propagation effects are examined for range transmission when the receivers are located up-slope and down-slope of the source, and for cross-range transmission when the receivers are located cross-slope of the source.