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Low Frequency Acoustical Propagation in a Shallow-Water Wedge

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In shallow-water environments long range propagation proceeds by repeated reflections from the surface and the bottom of the channel, as is the case for underwater sound of a wide spectral range, whose very low frequencies may propagate over large distances, without significant losses. In this paper, a 3-D benchmark model of the fluid wedge over an elastic bottom is applied to explain low frequency long range propagation in shallow water overlaying a sloping elastic-type seabed, such as a sedimentary rock exhibiting rigidity. The modeling approach is based on the modified method of generalized ray that furnishes a complete acoustic signal, thus comprised of contributions from all of the wave motions typical for the model (not only from the source signal and the regularly [specularly] reflected waves but also from the refracted [lateral] waves and the pseudo-Rayleigh and the Scholte interface waves), received in order of their arrivals at a large distance from the point source. When the source emits signals of a low frequency content, the contribution from the Scholte waves becomes dominant at large distances. Hence, low frequency long range propagation in a shallow-water wedge (coastal wedge) may indeed be governed by the Scholte waves.

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Promotional text

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Oral preference format

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