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The effects of non-linear internal wave curvature on acoustic propagation

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It is well known that coastal nonlinear internal waves can have curved wavefronts, due to either being generated at a "point source" such as a submarine canyon or valley or due to the wave being refracted by large scale water column or bathymetric features. We will explore the first case here, with the emphasis on circular wave fronts. Three cases of acoustic propagation in the vicinity of a circular wavefront will be considered: 1) the source within a soliton train, 2) the source in front of the soliton train, and 3) the source behind the soliton train. Simple geometric forms are presented showing how the curved wavefronts can lead to mode number and frequency dependent dispersion and shadowing effects. Work sponsored by Office of Naval Research.