



Ocean-acoustic studies of shoaling solitary waves in South China Sea.

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The generation and propagation of solitary waves at the Luzon Strait is predicted with the Lamb (1994) 2.5 D model. The interactions of barotropic tides with Luzon Strait topography generates internal bores and solitary wave trains. On the west side of Luzon Strait, solitary wave trains propagate towards China. At the slope and shelf break trains of solitary waves shoal. The study is undertaken along a vertical plane from Luzon Strait to the Asian Seas International Acoustic Experiment (ASIAEX) site and is broken up into two regions. The Luzon Strait region where generation and propagation occur and a shoaling region at the ASIAEX site. The parameters of the Luzon Strait region are tuned to yield solitary wave trains observed in ASIAEX, Windy Inland Experiment (WISE) and measurements by Klymak et al (2006).

The predicted solitary wave trains are then introduced into the shoaling region as trains of sech² solitons. The measured density profiles of Orr and Mignerey (2003) are taken as background. On the slope secondary solitary waves are generated and move up onto the slope. Around the shelf break square wave type of shapes can evolve for the depression solitons and change to square waves of elevation on the shelf. Comparison against the measurements of Orr and Mignerey (2003) are conducted. Acoustical propagation studies are undertaken by placing a source under the pycnocline and propagating energy up onto the slope and shelf break. The intensity of the acoustical field is studied as a function of frequency and energy distribution among the acoustical modes.