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Large-amplitude internal solitons and breathers in the Luson Straight

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The internal waves of amplitude of 140 m were observed in the Luson Straight in the South China Sea and sometimes their shapes were close to solitons and N-waves. In spite of the large depth in the straight (2000-2500 m) due to huge internal wave amplitudes the nonlinearity is big and generation of solitary waves is evident. The physical nature of N-wave origin is not quite understood. Such shapes may be resided to internal breathers which are another type of quasi-stable internal waves. Basing on the asymptotic theory of second order the necessary background conditions for generation of breathers are known, and the hydrology in the Luson Straight satisfies to these conditions. The appearance of the breathers in the Luson Straight is discussed here and the results of the numerical modeling in the framework of full and weakly nonlinear theories are given.