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Compound Solitons of Intense Internal Waves on the Oceanic Shelf

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It is well known that tides may form large-amplitude waves in the coastal zones of the oceans and seas. The evolution of such waves is usually described within the framework of model equations such as the Korteweg-de Vries equation and its modifications (for example, the Gardner equation) with variable coefficients. Intense internal waves in this case may frequently be represented in the form of solitons whose parameters slowly vary during propagation. The solitons expand in the course of transformation and approach the critical ones that may be represented as a superposition of kinks – change of fields of different polarities. In the current work the evolution of such compound solitons on a variable-depth shelf is analysed using a modified approximate approach. Results of the approximate analysis are compared with data of numerical simulation.