



Solitary waves in marginally stable stratified flows

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In this paper, we consider an analytical model of internal solitary waves in a weakly stratified two-layer fluid. A new model equation extends the long-wave approximation suggested in [1] for the non-linear Dureuil-Jacotin - Long equation. Parametric range of solitary wave is defined in the framework of constructed mathematical model. It is demonstrated that these wave regimes can realize to be close to parametric domain of the Kelvin - Helmholtz instability. It seems that such a marginal stability of internal waves could explain the formation mechanism of a very long billow trains in abyssal flows observed in [2].

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[2] H. Van Haren, L. Gostiaux, E. Morozov, R. Tarakanov. Extremely long Kelvin - Helmholtz billow trains in the Romanche Fracture Zone, *Geophys. Res. Lett.*, 2014, 44 (23), 8445-8451.