



Internal breather on the flow

Tatiana Talipova (1,2) and Efim Pelinovsky (1,2)

(1) Institute of Applied Physics, Nizhny Novgorod, Russian Federation (tgtalipova@mail.ru), (2) Nizhny Novgorod State Technical University n.a. R. E. Alekseev, Nizhny Novgorod, Russia

The existing of solitary waves in the stratified ocean is well-known; they are observed in fact in all areas of the World Ocean. Less attention is paid to the localized nonlinear wave packets – breathers. Their identification in the real data is difficult, and only a few examples are known [1-3]. It is not clear their geographical distribution. The necessity condition of their existing can be obtained in the framework of approximated theory based on the extended Korteweg-de Vries (Gardner) equation [4-5]. In particular, the breather solution of the Gardner equation exists if the coefficient of the cubic nonlinear term is positive. Charts of the cubic nonlinear term are now computed using the modern hydrology atlases contained the seawater density distribution in the World Ocean. Existing of oceanic current influences on the sign of the cubic nonlinear term that is critical for breathers. The theory of the breather in the framework of Gardner equation is revised taking into account the shear flow. All formulas described breather in the ocean stratified on density and shear flow are discussed. The particular case of the breather on the uniform current is analysed in details. Main effect here is the Doppler shift of temporal characteristics (frequencies of carrier and envelope waves) of the breather.

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