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Freak waves with deep trough in the sea (joint work with A V Proubov)

Two-layer fluid model is employed to explain the appearance of abnormal localized surface waves with deep trough in the sea due to the presence of stratification. The relationship between the widths of the layers is obtained when either solitary or periodic surface wave with a deep trough exists. In this case, the two-dimensional (2D) consideration allows achieving higher amplitude of the wave as a result of the 2D localization. Possible reasons for it are the non-linear interaction of the plane or the curved-front waves or a transverse instability of the single plane wave.

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