



## **Rogue Edge Waves in the Ocean**

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The investigation of anomalously large amplitude surface gravity waves on the sea surface (rogue or freak waves), which can appear suddenly and disappear in the same abrupt way, is very extensive in the recent years (see e.g. book [Kharif, Pelinovsky, Slunyaev 2009] and references there). However, any sudden displacements of water level or changes in flow velocities can also appear in the ocean wave motions of other types, including geophysical large-scale fields. The number of observations of such waves is still very small, they are even almost absent, but the investigations of such possible processes seem to be important for the applications. In the present paper the problem of rogue waves is discussed for edge waves in the coastal zone. Such waves belong to the class of topographically trapped waves, which are supposed to play dominant role in the dynamics of oceanic coastal zone. The amplitude of the waves reaches a maximum at the edge, and they are attenuated offshore. Direct visual observations of such waves are difficult, but such waves have been detected instrumentally in the nearshore wave field many times (see e.g. [Huntley and Bowen 1973; Bryan, Hows and Bowen 1998]). Edge waves are often considered as the major factor of the long-term evolution of coastal line, forming the rhythmic crescentic bars [Dolan and Ferm 1968; Bowen and Inman 1971; Guza and Inman 1975; Guza and Bowen 1981; Holman and Bowen 1982; Komar 1998]. In the present paper we summarize the results of the study of the nonlinear mechanisms of possible freak edge wave appearance: nonlinear dispersion enhancement and modulation instability.