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Experimental long term evolution of breathers in water waves

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Oceanic rogue waves may occur, due to the modulation instability, also referred to as the Benjamin-Feir instability. This instability can be also discussed within the framework of the nonlinear Schrödinger equation (NLS), which describes the dynamics of unstable packets in deep-water. In particular, through exact breather solutions of the NLS. Breathers are currently under intensive study, since their recent experimental observation in optics, water waves and in plasma proved the validity of the NLS to describe strong localizations in nonlinear dispersive media. We present evolution characteristics of breather, propagating over a long propagation distance in deep-water. In addition, we present several analytical and promising techniques, based on the theory of nonlinear wave theory, how an early stage of breather dynamics may be detected, before the occurrence of strong wave focusing.