



## **On the wave group asymmetry caused by nonlinear evolution**

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Many recent numerical and laboratory researches are dedicated to intense groups of surface gravity waves in deep water. It is well known, and has been observed in laboratory facilities many times, that intense wave groups become skewed with time and attain 'triangular' shapes. In-situ measurements confirm this general picture of oceanic wavegroups. The ability to describe skewed wave groups is one of the advantages of the famous Dysthe equations. At the same time, a number of studies within the frameworks of simplified and even fully nonlinear models report on purely symmetric wave groups. We review the existing observations of skewed wave groups and reproduce the situations in numerical simulations (restricting the attention to non-breaking cases) - to single out the crucial conditions which result in formation of skewed groups of nonlinear waves. We conclude that the triangular wave groups occur during the transitional stage of disintegration of intense wave trains, which finally give rise to more than one soliton-like wave groups.