



Life-time of freak waves of different shapes: dispersive focusing framework

Ekaterina Shurgalina (1) and Efim Pelinovsky (2)

(1) Nizhniy Novgorod State Technical University, Nizhniy Novgorod, Russian Federation (eshurgalina@mail.ru), (2) Department of Nonlinear Geophysical Processes, Institute of Applied Physics, Nizhny Novgorod, Russian Federation (pelinovsky@hydro.appl.sci-nnov.ru)

One of the possible mechanisms of freak-wave phenomenon in deep water is based on the dispersive focusing of unidirectional wave packets. It is applied to estimating life-times of rogue waves. Formation of the freak waves of different shapes like the single wave, the sign-variable wave, “two, three and four sisters” is considered in the frame of linear potential theory. The main attention is paid to comparing of life-times of waves of different shapes. The characteristic life-time of an abnormal wave increases as the number of individual waves grows, however the increase goes more slowly than with linear growth. Thus, the life-time of “three-sisters” is approximately 4.5 times greater than the life-time of sign-variable wave. It is shown that since approximately “four-five sisters” the life-time is great enough, and they are not perceived as suddenly appearing and disappearing freak waves.