Approximated solutions in the theory of the wave focusing in deep water

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The formation of the rogue waves from the transient group has been studied many times in the laboratory tanks. Analytical test for this process in deep water is the solution described the Gaussian wave train evolution (Clauss and Bergmann, 1986; Clauss, 1999; Magnusson et al., 1999). This solution is derived in narrow-band approximation in the framework of linear theory. According to this solution, the shape of rogue wave is the wave packet with Gaussian envelope ("three sisters"). In given paper the approximated solutions are derived with no limitation to the spectrum width. They demonstrate the formation of the solitary-like rogue wave from the transient group with amplitude and frequency modulation. For instance, the wave packet having the initial shape of "three sisters" transforms into the solitary-like rogue waves (wave amplification 2.1) for time 25T, $T = (g/l)^{1/2}$, where l is the characteristics length of rogue wave and g is gravity acceleration. It is interesting to mention that the wave pulse has the almost opposite polarity (to compare with the rogue wave polarity) on time 17T (in the vicinity of focal point). A set of various solutions illustrated the process of the rogue wave formation in deep water is presented.