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Numerical Simulation of FreakWaves: Detection, Predict and Breaking

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We consider the exact numerical simulation of nonlinear water waves on the basis of differential inclusions. In our numerical experiments the freak waves have been studied. We use the equations in conformal variables. Let us note that these equations are equivalent to the Euler equations for the area with free boundary. Using of the differential inclusions allows considering the external in [U+FB02]uences and the numerical errors.

In our work we have solved the following problems:

1. Detection of freak waves during the numerical experiments
2. Predict of freak waves in the numerical experiments
3. Breaking of freak waves by means of a blow to surface or other external in [U+FB02]uences

Also the results about the statistics of occurrence of freak waves will be presented in the talk. These results have been obtained in [1].

Bibliography

[1] V.E. Zakharov, A.I. Dyachenko, R.V. Shamin. How probability for freak wave formation can be found // THE EUROPEAN PHYSICAL JOURNAL - SPECIAL TOPICS Volume 185, Number 1, 113-124, DOI: 10.1140/epjst/e2010-01242-y