

On random inhomogeneous fields of non-linear deep-water waves

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Abstract

Back in 1980 Crawford, Saffman and Yuen [1] derived an equation for the time evolution of random non-linear gravity waves that, unlike existing models in wave turbulence, is not constrained to any of the usual assumptions of homogeneity, like the kinetic equation of Hasselman, Gaussianity and narrow banded fields, like the Alber equation.

In this talk we revisit the derivation of their model from the discrete Zakharov equation and present examples that illustrate how the time evolution is affected by the aforementioned assumptions. Then we restrict ourselves to the case of inhomogeneous Gaussian wave fields where we give a criteria for the stability of homogeneous sea states to inhomogeneous disturbances. This is a joint work with Raphael Stuhlmeier (University of Plymouth) and Michael Stiassnie (Technion).

References

- [1] Crawford, D. R., Saffman, P. G., & Yuen, H. C. (1980), Evolution of a random inhomogeneous field of nonlinear deep-water gravity waves, *Wave motion*, 2(1), 1-16.