Hydrodynamic Rogue Waves

Miguel Onorato
Dipartimento di Fisica, Università di Torino, Via P. Giuria, 1 - 10125 - Torino - ITALTY
email: miguel.onorato@gmail.com

Abstract:

I will discuss some issues related to the statistical properties of ocean surface gravity waves. I will show that, using the approach of wave turbulence theory, deviations from Gaussian statistics can be naturally described. In particular, I will discuss the role of bound and free modes in the determination of the statistical properties of the surface elevation. General equations for skewness and kurtosis as a function of the spectral wave action density are presented. The present results are the bases of the rogue wave forecasting method employed at the European Centre for Medium-Range Weather Forecasts. I will also discuss some experiments performed in a 280 meters wave tank and compare theoretical results with experimental ones. Analogies with nonlinear optics will be pointed out.