

Dmitry Agafontsev, (University of Moscow) - Integrable turbulence and formation of rogue waves: new results

vendredi 20 octobre 2017 10:15 (40 minutes)

We study numerically the nonlinear stage of modulational instability (MI) of cnoidal waves, in the framework of the focusing one-dimensional Nonlinear Schrodinger (NLS) equation. Cnoidal waves are the exact periodic solutions of the NLS equation and can be represented as a lattice of overlapping solitons. MI of these lattices lead to development of “integrable turbulence”. We study the major characteristics of the turbulence and demonstrate their dependence on the degree of “overlapping” between the solitons within the cnoidal wave. Our analysis shows that, in the asymptotic state, when the overlapping is weak, the interactions of the system reduce to two-soliton collisions with two-fold increase in amplitude, while for strong overlapping the probability of rogue waves occurrence is not significantly higher than that for a linear system.