DMITRY PELINOVSKY, McMaster University

Orbital stability of periodic waves and black solitons in the cubic defocusing NLS equation

Periodic waves of the one-dimensional cubic defocusing NLS equation are considered. Using tools from integrability theory, these waves have been shown to be linearly stable and their Floquet-Bloch spectrum has been explicitly computed. We combine here the first four conserved quantities of the NLS equation to give a direct proof that small amplitude periodic waves are orbitally stable with respect to subharmonic perturbations, with period equal to an integer multiple of the period of the wave. We also show that the black soliton is an unconditional minimizer of a fourth-order energy functional, which gives a simple proof of orbital stability with respect to perturbations in $H^2(\mathbb{R})$.