The energy critical limit of ground state solitons

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Abstract

We consider the energy-critical limit of the ground state solitary waves of the pure power, focusing, energy sub-critical nonlinear Schroedinger equation in 3D. We show that after suitable (and precisely determined) rescaling, driven by the threshold resonance present in the energy critical linearized problem, the ground states converge to the the Aubin-Talenti function (with precise error estimate). We discuss implications for the sub-critical linearized NLS, and for the best constant in the Gagliardo-Nirenberg inequality. This is joint work with Tai-Peng Tsai and Ian Zwiers.

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