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Asymptotic stability of small bound states in the discrete NLS equation

Asymptotic stability of small bound states in one dimension is proved in the framework of a discrete nonlinear Schrödinger equation with septic and higher power-law nonlinearities and an external potential supporting a simple isolated eigenvalue. The analysis relies on the dispersive decay estimates from Pelinovsky and Stefanov (2008) and the arguments of Mizumachi (2008) for a continuous nonlinear Schrödinger equation in one dimension. Numerical simulations suggest that the actual decay rate of perturbations near the asymptotically stable solitons is higher than the one used in the analysis.

This is a joint work with A. Stefanov and P. Kevrekidis.