

Seminar of the Work Group
Nonlinear Partial Differential Equations
SS 26

July 15th, 2026, 11:30 - 13:00
Seminar room: SR 3.069

Orbital Stability for Cnoidal Waves in the Defocusing Nonlinear Schrödinger Equation under Localized Perturbations

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Abstract

In this talk, we establish an orbital stability result for cnoidal waves in the defocusing nonlinear Schrödinger equation under localized perturbations. Previously, only orbital stability under coproduct perturbations was known [Gallay, Pelinovsky '15]. Our proof relies on higher-order energies, where the second variation exhibits nonnegative spectrum. Our main result demonstrates that a double-modulated perturbation—accounting for both translational and rotational invariance—remains bounded if the initial perturbation is sufficiently small. A central challenge lies in finding appropriate modulation functions. By employing spectral analysis and Floquet-Bloch theory, we derive coercive energy estimates that provide lower bounds for the second variation. This work is joint work with E. Bukieda, P. Kunstmann, and B. de Rijk.