Spectral Theory and Dynamics of Quantum Systems

GRADUIERTENKOLLEG 1838

Guest lecture

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Standing waves on the tadpole graph

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15:00 h, Room 8.122
University of Stuttgart, Pfaffemwaldring 57

Abstract: Edge bifurcations of standing waves are studied in the nonlinear Schrödinger (NLS) equation on a tadpole graph (a ring attached to a semi-infinite line subject to the Kirchhoff boundary conditions at the junction). We show by using a modification of the Lyapunov-Schmidt reduction method that the bifurcation of localized standing waves occurs for every focusing power nonlinearity. We distinguish a primary branch of never vanishing standing waves bifurcating from the trivial solution and an infinite sequence of higher branches with oscillating behavior in the ring. The higher branches bifurcate from the branches of degenerate standing waves with vanishing tail outside the ring.