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E I N L A D U N G

im Rahmen des Literaturseminars

zum Vortrag

von

Oleg Evnin

(Bangkok/Brussels)

über

„Quantum resonant systems, integrable and chaotic“

Abstract:

Resonant systems emerge as weakly nonlinear approximations to problems with highly resonant linearized perturbations. Examples include nonlinear Schrödinger equations in harmonic potentials and nonlinear dynamics in Anti-de Sitter spacetime. The classical dynamics within this class of systems can be very rich, ranging from fully integrable to chaotic as one changes the values of the mode coupling coefficients. I'll report on investigations of quantum infinite-dimensional resonant systems, which are mathematically a highly special case of two-body interaction Hamiltonians (extensively studied in condensed matter, nuclear and high-energy physics). Despite the complexity of the corresponding classical dynamics, the quantum version turns out to be emarkably simple, with the Hamiltonian being block-diagonal in the Fock basis, with all blocks of varying finite sizes. Being solvable in terms of diagonalizing finite numerical matrices, these systems are thus arguably the simplest quantum field theories known to man.
I'll discuss how to perform the diagonalization in practice, and mention both numerical patterns emerging for the integrable cases, and the spectral statistics, which efficiently distinguishes the special integrable cases from generic (chaotic) points in the parameter space. A wide range of further potential applications can be envisaged, due to the computational simplicity and dynamical richness of quantum resonant systems.

Zeit: Mittwoch, 26.9.2018, **14.00**
Ort: Arbeitsgruppe Gravitation, Währinger Straße 17,
Seminarraum A**, 2. Stock**

gez.: P. Chrusciel, M. Maliborski