Control of the Multi-input Schrdinger Equation: The Lie-Galerkin Condition

Marco Caponigro

CNAM, Paris

marco.caponigro@cnam.fr

Abstract: We present a sufficient condition for approximate controllability of the bilinear discrete-spectrum Schrdinger equation in the multi-input case. This condition is more general than those present in the literature even in the single-input case and allows the spectrum of the uncontrolled operator to be very degenerate (e.g. to have multiple eigenvalues or equal gaps among different pairs of eigenvalues). The controllability extends moreover to simultaneous controllability, approximate controllability in H^s , and tracking in modulus. Among the possible applications we consider a rotating polar linear molecule, driven by three orthogonal external fields: a model presenting infinitely many degeneracies and resonances in the spectrum.