Non-uniqueness of normalized ground states for nonlinear Schrödinger equations

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Abstract

The talk discusses general non-uniqueness results for normalized ground states of nonlinear Schrödinger equations with power nonlinearity. Basically, we show that, whenever in the L^2 -subcritical regime ground states exist at every mass, for nonlinearity powers close to the L^2 -critical exponent there is at least one value of the mass for which ground states are non-unique. As a consequence, we also show that, whenever such non-uniqueness occurs, there exist action ground states that are not normalized ground states. These results have been obtained both when the problem is set on metric graphs (compact and non-compact) and when it is posed on bounded domains with homogeneous Neumann boundary conditions.