

# Nonlinear Bound States with Prescribed Angular Momentum

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**Abstract:** We prove the existence of a class of orbitally stable bound state solutions to nonlinear Schrödinger equations with super-quadratic confinement in two and three spatial dimensions. These solutions are given by time-dependent rotations of a non-radially symmetric spatial profile, which in itself is obtained via a doubly constrained energy minimization. One of the two constraints imposed is the total mass, while the other is given by the expectation value of the angular momentum around the  $z$ -axis. We also study the connection between our approach and minimizers subject to only a single mass constraint.