



Minisymposium 9 - Nichtlineare Evolutionsgleichungen und Probleme mit freiem Rand

Existence and asymptotic shape of solutions to a nonlinear Schrödinger system

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We consider the two coupled Schrödinger equations

$$-\Delta u + u = u^3 + \beta v^2 u, \quad -\Delta v + v = v^3 + \beta u^2 v$$

with coupling parameter $\beta \in \mathbb{R}$. Of physical interest are bound states, i.e., positive solutions defined on the whole space and decaying exponentially at infinity. While for $\beta > 0$ all bound states are known to be radial, we show the existence of infinitely many nonradial solutions (with prescribed symmetries) in the repulsive case $\beta < -1$ in dimensions $N = 2, 3$. For the corresponding homogeneous Dirichlet problem in a ball, we also study the asymptotic shape of radial solutions in the segregation limit $\beta \rightarrow -\infty$.

This is joint work with Juncheng Wei.