



北京理工大学

数学与统计学院学术报告

Uniform global Lipschitz bounds of solutions to nonlinear Schrodinger systems with strong competition

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摘要: We study a class of semi-linear elliptic systems of Gross-Pitaevskii type with Dirichlet boundary conditions, and prove that uniform boundedness of the solutions implies their uniform global Lipschitz boundedness as the competition constant goes to infinity, this improves interesting uniform Holder regularity results of Terracini et al.(CPAM, 2010) to the optimal case and cover the one dimension case, here the space dimension can be arbitrary and the domain can be unbounded. We also obtain the uniform interior Lipschitz bounds of the solutions, and develop the result of Soave and Zilio (ARMA, 2015) in a general setting. The proofs are based on blow-up analysis and Alt-Caffarelli-Friedman type monotonicity formulae both in the domain and near the domain boundary(joint with Zexin Zhang).

个人简介: 张志涛, 中国科学院数学与系统科学研究院二级研究员、博士生导师, 华罗庚数学首席研究员, 中国科学院特聘研究员(核心骨干), 中国科学院大学岗位教授。国家杰出青年基金获得者、国家万人计划领军人才、科技部中青年科技创新领军人才、洪堡学者。长期从事非线性泛函分析理论和应用的前沿研究, Springer出版社出版专著一部, 科学出版社出版合著一部, 在 Journal of Functional Analysis, Annales de l'Institut Henri Poincare Analyse Non Lineaire, J. Differential Equations, Calculus of Variations and PDE, Transactions of the American Mathematical Society等著名学术刊物发表论文130多篇, SCI 120多篇。在困难的自由边界问题, Bose-Einstein condensates Schrodinger方程组, 生物竞争方程组等众多方面取得重要成果, 解决了困难的Terracini猜想和3维Henon-Lane-Emden猜想。这些成果产生了广泛的影响, 被1100多名数学家引用2800多次, 单篇最高459次, 有的已成为基本参考文献, 在研究领域起着引领作用, 多次应邀在重要国际会议上作大会报告。担任Springer 期刊Partial Differential Equations and Applications 主编, 以及DCDS等6个国际刊物编委, 主持科技部国家重点研发项目1项和主持或参与基金委重点等项目多项。曾兼任江苏大学数学科学学院院长、中国数学会副秘书长。