西北大学数学学院 非线性科学研究中心
School of Mathematics Northwest University

报告题目

Riemann problem of the defocusing complex modified KdV equation: Whitham modulation theory

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报告摘要：

The complete classification of solutions to the Riemann problem of the defocusing complex modified KdV equation with step-like initial condition is studied by Whitham modulation theory. All kinds of combination solutions consisting of genus-0 regions, genus-1 regions or genus-2 regions are found by classifying the Riemann invariants. It is demonstrated that a large oscillating region can be composed of four basic genus-1 dispersive shock waves, a case of solution may be consisted of up to six regions, and the plateau, vacuum, rarefaction wave and dispersive shock wave can coexist in the same solution region. Moreover, the genus-2 region, produced from the collision of two dispersive shock waves, is described in detail by the genus-2 Whitham equations. The direct numerical simulations on the defocusing complex modified KdV equation show remarkable agreement with the results from Whitham modulation theory.

报告人简介：

王灯山，北京师范大学数学科学学院，教授、博士生导师。主要从事可积系统和渐近分析方面的研究，在Analysis & PDE, Physical Review Letters, J. Differential Equations, J. Nonlinear Science 和Physica D等国际期刊发表学术论文90余篇，主持国家自然科学基金面上项目等国家级和省部级项目10余项，曾获得茅以升北京青年科技奖，并参与获得北京市科学技术奖一等奖。入选北京市“科技新星”计划、北京市“高创计划”青年拔尖人才、北京市“长城学者”计划以及爱思唯尔2020、2021年中国高被引学者。

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