


复旦大学数学科学学院
数学综合报告会

报告题目：Soliton resolution for the sine-Gordon equation

报告人：陆冰滢 博士 (University of Bremen)

时间：2021-08-18 星期三 14:30--15:30

地点：腾讯会议：525 721 484

报告摘要：

In this talk, we study the long-time dynamics and stability properties of the sine-Gordon equation f_{tt}−f_{xx}+\sin f=0. Firstly, we use the nonlinear steepest descent for Riemann-Hilbert problems to compute the long-time asymptotics of the solutions to the sine-Gordon equation whose initial condition belongs to some weighted Sobolev spaces. Secondly, we study the asymptotic stability of the sine-Gordon equation. It is known that the obstruction to the asymptotic stability of the sine-Gordon equation in the energy space is the existence of small breathers which is also closely related to the emergence of wobbling kinks. Combining the long-time asymptotics and a refined approximation argument, we analyze the asymptotic stability properties of the sine-Gordon equation in weighted energy spaces. Our stability analysis gives a criterion for the weight which is sharp up to the endpoint so that the asymptotic stability holds.