复旦大学数学科学学院
数学综合报告会

报告题目：Low regularity ill-posedness for elastic waves driven by shock formation

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时间：2020-9-17 星期四 15:00-16:00

地点：Zoom 会议 ID: 645 736 85274，密码: 092020

报告摘要：In this talk, we generalize a classic result of Lindblad on the scalar quasilinear wave equation and we show that the Cauchy problem for 3D elastic waves, a physical quasilinear wave system with multiple wave-speeds, is ill-posed in $H^3(R^3)$. We further prove that the ill-posedness is caused by instantaneous shock formation, which is characterized by the vanishing of the inverse foliation density. The main difficulties arise from the multiple wave-speeds and its associated non-strict hyperbolicity. We design and combine a geometric approach and an algebraic approach to overcome these difficulties. This is based on joint work with Xinliang An and Haoyang Chen.