



复旦大学数学科学学院 数学综合报告会

报告题目: Spinorial Div-Curl Structure and Bilinear Null-Form Estimates for Dirac Equations

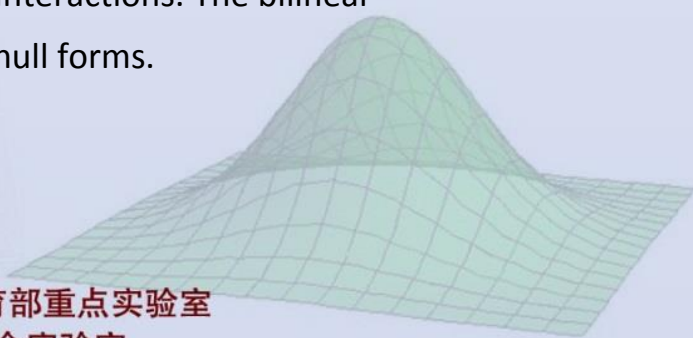
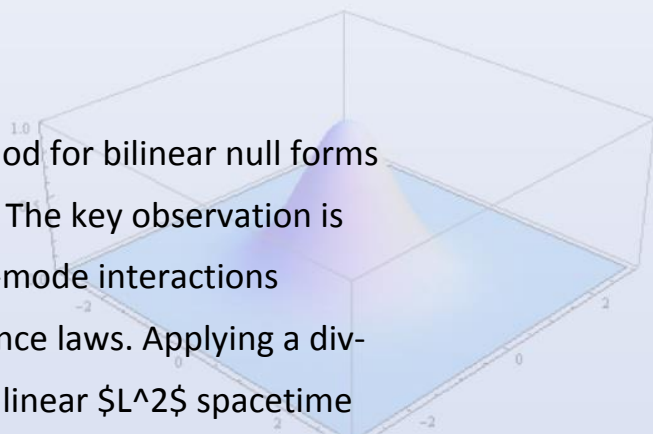
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时间: 2026-10-08 星期四 13:30-14:30

地点: H5410

报告摘要:

We will talk about a physical-space div-curl method for bilinear null forms of the Dirac equation in three space dimensions. The key observation is that spinor null forms select precisely the mixed-mode interactions controlled through one-dimensional charge balance laws. Applying a div-curl estimate to these balance laws, we obtain bilinear L^2 spacetime bounds directly from the first-order Dirac equation. In the massless case, these bounds recover the lower-frequency dependence of wave null-form estimates. In the massive case, pseudoscalar interactions on the same energy branch gain a factor K/m over the direct product bound at frequencies $K \ll m$. This gain is absent in scalar interactions. The bilinear estimates also yield bounds for cubic spinorial null forms.



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