

# 凝聚态物理-北京大学论坛

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## Measurements of Quasi-Particle Tunneling in the $\nu = 5/2$ Fractional Quantum Hall Regime

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地点：北京大学物理大楼中212教室

林熙，2003毕业于中国科学技术大学物理系。2003到2008在美国宾州州立大学物理系攻读博士学位。2008到2012先后在美国宾州州立大学和美国麻省理工学院从事博士后研究。现全职工作于北京大学。主要科研经历为supersolid和FQHE领域的低温物性测量。

**报告摘要：** Some models of the  $5/2$  fractional quantum Hall state predict that the quasiparticles, which carry the charge, have non-Abelian statistics: exchange of two quasiparticles changes the wave function more dramatically than just the usual change of phase factor. Such non-Abelian statistics would make the system less sensitive to decoherence, making it a candidate for implementation of topological quantum computation. We measure quasiparticle tunneling as a function of temperature and dc bias between counterpropagating edge states. Fits to theory give  $e^*$ , the quasiparticle effective charge, close to the expected value of  $e/4$  and  $g$ , the strength of the interaction between quasiparticles, close to  $3/8$ . Fits corresponding to the various proposed wave functions, along with qualitative features of the data, strongly favor the Abelian  $331$  state.

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Photograph by Xiaodong Hu