Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Intrinsic Damping of Collective Spin Modes in a Two-Dimensional Fermi Liquid with Spin-Orbit Interaction[1] DMITRII MASLOV, University of Florida, Gainesville, SAURABH MAITI, University of Florida, Gainesville and National High Magnetic Field Lab., Tallahassee — We address the issue damping of spin collective modes in systems with spin orbit coupling in 2D. We show that these modes exist for arbitrary nature of spin-orbit coupling and are intrinsically damped even in the long wavelength limit. This damping is driven by electron-electron interactions and is unique to spin orbit coupled systems. Its origin is linked to an imperfect cancellation of the self energy and vertex contributions of the interaction. In the Fermi-liquid language, this is an effect arising from residual interaction between quasiparticles. This damping mechanism exists already at T=0 and without impurities and/or phonons. We also discuss the consequences of this damping for the experiment.

[1]This work was supported by the National Science Foundation via grant NSF DMR-1308972.

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Date submitted: 12 Nov 2014 Electronic form version 1.4