Abstract Submitted
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Viscous relaxation and transport in a 2d Fermi liquid[1] DMITRY NOVIKOV, Princeton University — Long-wavelength transport and relaxation properties of interacting systems are naturally described in terms of hydrodynamic modes. Here we focus on the viscosity of the two-dimensional (2d) interacting fermions. It is well-known that the viscosity of a clean Fermi liquid in three dimensions is proportional to the quasiparticle lifetime, scaling as E_F/T^2. We find that for the 2d fermions, the viscosity is logarithmically enhanced by the factor of $\ln(E_F/T)$, that arises from the phase-space restrictions for quasiparticle scattering in two dimensions. In particular, these restrictions enforce the dominant contributions of the collisions between quasiparticles from opposite sides of the Fermi surface, the effect specific to the 2d geometry. We discuss the effects of viscous modes that can manifest themselves in the electron transport in the metallic phase, and in the momentum relaxation of cold fermion gases.

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