The orbitropic effect in superfluid helium-3 B-phase boundaries

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We have studied the influence of orbital viscosity on the dynamics of the order parameter texture in the superfluid B phase of helium-3 near a moving boundary. When the interface between the B phase and the boundary moves, the thermally-excited quasiparticles redistribute in response to changes in the texture of the orbital angular momentum. In our model this bestows a significant effective mass and gives a mechanism for friction impeding the motion of the boundary. The model has been tested quantitatively against previously unexplained measurements of the anomalously large and non-linear dissipation of a moving AB interface.

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