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Particle-vortex interactions in quantum turbulence[1] ENRICO FONDA, Università di Trieste - University of Maryland, KATEPALLI R. SREENIVASAN, New York University, DANIEL P. LATHROP, University of Maryland — We study quantum turbulence in a thermal counterflow of He II, using sub-micron and micron-sized frozen particles. For low heat fluxes, these particles can either trace the motion of the normal component or track quantized vortices when they get trapped on their cores. For high heat fluxes the increased number of particle-vortex interactions and scattering events result in a different state in which the particles track neither the vortices nor the normal component. Analyzing the trajectories of tracers of different size and density for a wide range of heat fluxes, we investigate the particle-vortex interaction mechanism. The results are used to test analytical and numerical models, and explain the discrepancy between two previous counterflow experiments.

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