Quantum Turbulence Produced by Uniformly Moving Grid in ^{4}He in the T=0 Limit

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Uniform flow through a grid is widely recognized in classical fluid dynamics as the benchmark for creating homogeneous isotropic turbulence. A similar standard, which can be used at very low temperatures, has been eagerly awaited in the field of quantum turbulence. We have designed and built an apparatus that allows a grid to be pulled at constant velocities of up to 20 cm/s through a channel filled with superfluid ^{4}He below 100 mK. We probe the turbulence produced by the motion of the grid by measuring the vortex line density, which is achieved by observing attenuation of the signal from charged vortex rings propagating across the channel volume. The decay of turbulence produced in this way is compared to the dissipation of turbulence created by impulsive spin-down[1] of the same channel from uniform rotation to rest and also turbulence created by intense ion injection into the experimental volume.

1. P. M. Walmsley, A. I. Golov, H. E. Hall, A. A. Levchenko, and W. F. Vinen, Phys. Rev. Lett. **99**, 265302 (2007)

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