

The turbulent drag in superfluids

S.L. Ahlstrom^a, D.I. Bradley^a, M. Človečko^b, S.N. Fisher^a, A.M. Guénault^a, E. Guise^a, R.P. Haley^a, O. Kolosov^a, P.V.E McClintock^a, G.R. Pickett^a, M. Poole^a, R. Schanen^a, V. Tsepelin^a, and A. Woods^a

^aDepartment of Physics, Lancaster University, UK

^bPresent Address: Slovak Academy of Sciences, Kosice, Slovakia

We present studies of quantum turbulence in superfluid ^4He and in superfluid $^3\text{He-B}$. Turbulence was produced using a variety of mechanical oscillators; tuning forks, vibrating wires and vibrating grids. The resonant frequencies cover a wide range from tens of hertz to tens of kilohertz. The critical velocity for turbulence nucleation in superfluid ^4He is consistent with a square root dependence on frequency. At high frequencies, the damping is dominated by sound emission.

At very low temperatures where the normal fluid fraction is negligible, the turbulent drag on a grid in superfluid $^3\text{He-B}$ is significantly larger than that in superfluid ^4He . In superfluid $^3\text{He-B}$ we believe that turbulence is generated simultaneously with quasiparticle excitations and this produces extra drag.

Section: VT - Vortices and turbulence

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