

Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

Three Dimensional Quantized Vortex Dynamics in Superfluid Helium DAVID MEICHLE, PETER MEGSON, DANIEL LATHROP, University of Maryland — Vorticity is constrained to line-like topological defects in quantum superfluids, such as liquid Helium below the Lambda transition temperature of 2.17 Kelvin. A tangle of vortices exists in a dissipative dynamical state called quantum turbulence, which has quantitative features distinct from classical turbulence. To study the vortex dynamics, we have invented a novel method to disperse fluorescent nanoparticles directly into the superfluid which become trapped on the vortex cores. Using a newly constructed multi-camera stereographic microscope, we present new data showing vortex reconnections and Kelvin waves with fully three-dimensional particle trajectories. These events are of scientific interest as they play a key role in the dissipation of quantum turbulence.

David Meichle
University of Maryland

Date submitted: 01 Aug 2014

Electronic form version 1.4