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A Quasiparticle Detector for Quantum Turbulence Imaging in Superfluid 3He-B SHAUN FISHER, IAN BRADLEY, MARCEL CLOVEVCKO, SEAN AHLSTROM, ED GUISE, RICH HALEY, STEVE HOLT, GEORGE PICKETT, ROCH SCHANON, VIKTOR TSEPELIN, ANDREW WOODS, Lancaster University — We describe the development of a two-dimensional quasiparticle detector to visualise quantum turbulence in superfluid 3He-B at ultra-low temperatures. The detector consists of 25 pixels each containing a miniature quartz tuning fork. The damping on each fork provides a measure of the local quasiparticle flux. The detector is illuminated by a beam of ballistic quasiparticles generated from a near-by black-body radiator. Vortices have a large cross-section for Andreev reflecting ballistic quasiparticles at low temperatures. We generate a tangle of vortices (quantum turbulence) in the path of the beam using a vibrating wire resonator. The vortices cast a shadow onto the face of the detector due to the Andreev reflection. This allows us to image the vortex tangle and to investigate the tangle dynamics. We describe the detector and present some preliminary results.

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