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**Measurements of persistent currents in normal metal rings with cantilever torsional magnetometry** WILLIAM SHANKS, ANIA BLESZYNSKI JAYICH, BRUNO PEAUDECERF, JACK HARRIS, Department of Physics, Yale University — We have measured the magnetization of arrays of micron-scale aluminum rings at low temperatures and in high magnetic fields using cantilever torsional magnetometry. We see clear evidence of normal state persistent currents in these rings. The current's dependence on magnetic field, temperature and the rings' circumference is consistent with theoretical predictions (due to Riedel and von Oppen) for non-interacting electrons in the diffusive regime. To fully characterize these samples, we also measured the magnetization of codeposited rings in the superconducting state and the magnetoresistance of codeposited wires. Together these measurements provide an especially clear picture of the normal-state persistent currents.

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