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Search for Time-Reversal Symmetry Breaking Effects in Sr_2RuO_4 Using Scanning Magnetic Microscopy PER BJÖRNSSON, KATHRYN MOLER, Department of Applied Physics and Geballe Laboratory for Advanced Materials, Stanford University, YOSHI MAENO, Department of Physics and International Innovation Center, Kyoto University — Strontium ruthenate (Sr_2RuO_4) is a spin-triplet superconductor ($T_c = 1.5$ K) which is thought to have a two-component time reversal symmetry breaking (TRSB) order parameter. We have imaged patterned samples of this material using sub-micron Hall probes in search of magnetic fields that are expected to be caused by spontaneous currents at the edge of a TRSB superconductor. Because of the localization of the currents to edges, both high spatial resolution and high sensitivity to magnetic fields are necessary in order to provide strong tests of the theory. We will compare our measurement results with theoretical models for possible magnetic field distributions in superconductors with TRSB order parameters.

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