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Quantum oscillations in superconducting mesoscopic rings of Sr_2RuO_4[1] XINXIN CAI, YIQUN YING, NEAL STALEY, Pennsylvania State University, YAN XIN, NHMFL, Florida State University, DAVID FOBES, TIJIANG LIU, ZHIQIANG MAO, Tulane University, YING LIU, Pennsylvania State University — Sr_2RuO_4 has attracted considerable amount of attention recently because of its potential application in topological quantum computing as a $p_x \pm ip_y$ superconductor. Cantilever magnetometry measurements carried out on doubly connected Sr_2RuO_4 samples of a micron size were found to exhibit jumps in magnetization suggesting the presence of both integer and half-integer flux quanta. To search for quantum oscillations with periods corresponding to integer and half-integer flux, we prepared micron size rings of Sr_2RuO_4 from thin flakes of Sr_2RuO_4 obtained by mechanical exfoliation and carried out transport measurements at low temperatures. Photolithography technique was applied to make contact probes on the flake and focused ion beam (FIB) was used in the fabrication. Disorder introduced by the FIB process employing high-energy beams of Ga ions was characterized by transmission electron microscopy. We succeeded in the preparation of superconducting rings of roughly 1 μm in diameter with 200$\sim$400nm line width. Strong oscillations of ring resistance with a conventional period of full flux quantum have been observed. In some samples a different period of oscillations was also found at high field range. The nature of these oscillations will be discussed.

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