Abstract Submitted
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Ferromagnetic Josephson Junctions[1] TRUPTI KHAIRE, WILLIAM PRATT, NORMAN BIRGE, Department of Physics and Astronomy, Michigan State University, East Lansing, MI 48824 — Superconducting correlations cannot penetrate into a ferromagnet over a large distance due to the pair breaking effect of the exchange field. Ferromagnet/Superconductor (F/S) systems are often studied using weak ferromagnetic alloys with smaller exchange energy and correspondingly larger penetration depth. We are studying S/F/S junctions using the weak ferromagnetic alloy, CuNi [1]. The samples are fabricated by sputtering the S/F/S trilayer onto a Si substrate; they are subsequently patterned using trilayer photolithography and ion milling to obtain pillars of 50 micron diameter. Measurements performed on these pillars at 4K show the Josephson effect with the expected modulation of the critical current as a function of applied magnetic field. Because spin-flip scattering and spin-orbit scattering are strong in weak ferromagnetic alloys such as CuNi, there is an incentive to work with strong ferromagnets. The results from our CuNi data confirm the robustness of the sample fabrication technique and pave the way to future studies of Josephson junctions with strong ferromagnets such as Ni. [1] V. A. Oboznov, Phys. Rev. Lett. 96, 197003 (2006)

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