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Magnetic Field Reentrant Superconductivity in Aluminum Nanowires* TERENCE BRETZ-SULLIVAN, ALLEN GOLDMAN, School of Physics and Astronomy, University of Minnesota — Reentrance to the superconducting state through the application of a magnetic field to quasi-one dimensional superconductors driven resistive by current, is counter to the expected properties of superconductors. It was not until recently that a microscopic mechanism explaining the phenomenon was proposed in which superconductivity and phase slip driven dissipation coexist in a non-equilibrium state.[1] Here we present additional results of magnetic field induced reentrance into the superconducting state in quasi-one-dimensional aluminum nanowires with an in-plane magnetic field both transverse to, and along the wire axis. The reentrant behavior is seen in the magnetic field dependence of the I-V characteristic and resistance vs. temperature, and in the wire's magnetoresistance at 450mK. [1]Y. Chen, Y-H. Lin, S.D. Snyder, A.M. Goldman and A. Kamenev, Nature Physics 10, 567-571 (2014). * This work was supported by DOE Basic Energy Sciences Grant DE-FG02-02ER46004. Samples were fabricated at the Minnesota Nanofabrication Center. Parts of this work were carried out in the University of Minnesota Characterization Facility, a member of the Materials Research Facilities Network (www.mrfn.org) funded via the NSF MRSEC program.

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