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Fluctuation diamagnetism in mesoscopic Aluminum rings HENDRIK BLUHM, NICHOLAS C. KOSHNICK, Stanford University, MARTIN E. HUBER, University of Colorado, Denver, KATHRYN A. MOLER, Stanford University — We have measured the magnetic response of mesoscopic, superconducting Al rings using a high sensitivity scanning SQUID microscope. We find that for sufficiently small, quasi one- dimensional rings, the rounding of the superconducting transition due to thermal fluctuations is in good agreement with theoretical preditctions. The main effects are a fluctuation tail in the amplitude of the response near T_c and a suppression of the apparent T_c as determined from the temperature dependence of the superfluid density below the fluctuation tail compared to the extracted mean field T_c by several mK. In larger rings, the tail is less pronounced due to the lack of phase coherence.

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