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Competition of Point and Correlated Vortex Pinning in Irradiated YBCO[1] WAI-KWONG KWOK, ULRICH WELP, JOHN SCHLUETER, RUOBING XIE, Materials Science Division, Argonne National Laboratory, JIONG HUA, ZHILI XIAO, Dept. of Physics, Northern Illinois University, LISA M. PAULIUS, Dept. of Physics, Western Michigan University, MORTEN R. ESKILDSEN, Dept. of Physics, University of Notre Dame — We present a systematic study of vortex pinning on an optimal-doped untwinned $YB_2Cu_3O_{7-\delta}$ single-crystal irradiated with 1.4 GeV Pb ions and subsequently irradiated with protons. Irradiation to a dose matching field of B_Φ=2T completely transforms the first order vortex melting transition to a higher order Bose glass transition. The transformation is also marked by a pronounced increase in vortex pinning at all temperatures, determined from SQUID measurements. We compare the irreversibility line and the remanent moment of the irradiated sample after subsequent irradiation with protons to determine the contribution to vortex pinning from point and correlated defects on the same sample.

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