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Investigation of vortex-matter states in $\mathbf{Y_{1-x}Pr_xBa_2Cu_3O_{7-\delta}}$ B. J. TAYLOR, D. J. SCANDERBEG, M. B. MAPLE, University of California, San Deigo, C. KWON, California State U., Long Beach — The magnetic field - temperature (H - T) phase diagram of the doped high-temperature superconducting cuprate system $Y_{1-x}Pr_xBa_2Cu_3O_{7-\delta}$ [x = 0.0 - 0.4] has been extended to high magnetic fields previously unexplored for this system. The vortex-matter in thin film samples has been investigated via transport measurements in slow swept and static magnetic fields up to 45 tesla and to temperatures as low as 1.4 K. Analysis of the vortex-glass melting line (irreversibility line), $H_g(T)$ ($H_{irr}(T)$), indicates that it follows the empirical scaling form $(H_g/H^*) \sim (1\text{-}T/T_c)^n$ for all concentrations x, and is broken into three distinct regions with n $\sim$ 1.2, 2.0, 3.1 with increasing field. Furthermore, the field values at which the change in behavior occur are at $H_1{}^* \sim Hg(T = 0.6$ Tc) and $H_2{}^* \sim H_g(T = 0.3$ Tc) $\sim 3H_1{}^*$. All measurements above 9 tesla were performed at the National High Magnetic Field Laboratory (NHMFL) facilities in Tallahassee FL, USA. This work was supported by the U. S. Department of Energy (DE-FG02-04ER46105)

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