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Low Temperature Magnetometry Measurements of the Heavy Fermion Superconductor Nd1−xCexCoIn5 with x = 0.98, 0.95, and 0.90
KENNETH PURCELL, SARAH SCHWARTZ, University of Southern Indiana, CEDOMIR PETROVIC, Brookhaven National Laboratory, KEVIN STORR, Prairie View A&M University — The Nd1−xCexCoIn5 alloys evolve from local moment magnetism x =0 to heavy fermion superconductivity x =1, as the Nd substitution alters the level of 4f-conduction electron coupling. Superconductivity has been shown to exist in Nd concentrations between x = 0 and x = 0.22. We report the temperature and angular dependence of the critical field of the superconducting state of the x = 0.98, 0.95, and 0.90 doping levels at temperatures ranging from 20 – 500 mK, investigating the evolution of the phase diagram for different concentrations of Nd at these previously unexplored low temperatures. No evidence of a low temperature mixed superconducting and magnetic mixed state was observed such that as that seen in CeCoIn5. The suppression of the critical field is more dramatic than the application of pressure and was observed to be rather anisotropic in line with the higher temperature measurements.

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