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Magnetic Neutron Scattering Study of $\mathbf{Nd_{1.85}Ce_{0.15}Cu_{1-y}Ni_yO_4}$ Single Crystals INNA VISHIK, Stanford University, GUICHUAN YU, Stanford University, EUGENE MOTOYAMA, Stanford University, OWEN VAJK, National Institute of Standards and Technology, MARTIN GREVEN, Stanford University
— In order to arrive at a deeper understanding of the interplay between superconductivity and magnetism in the high-temperature superconductors, it is of interest to study the effects of impurity-doping on the copper site. A large body of work along these lines exists for hole-doped materials, yet relatively little is known about the effects of such impurities on the prototypical electron-doped material $(Nd,Ce)_2CuO_4$. In previous work, paramagnetic dopants (Ni, Fe) were shown to lower T_c much more abruptly than non-magnetic ones (Zn). We grew large single crystals of $Nd_{1.85}Ce_{0.15}Cu_{1-y}Ni_yO_4$ using the traveling-solvent floating-zone technique and characterized our samples using SQUID magnetometry and DC transport measurements. Here we report on neutron scattering results for the spin correlations as a function of nickel concentration and temperature for superconducting ($y < 0.01$) and non-superconducing ($y > 0.01$) compositions.

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