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Magnetic anisotropy of doped (Fe, Mn, Cr) $NbSe_2$ A. F. ISAKOVIC, LASSP, Cornell University — We investigated the behavior of magnetic dopants (Mn, Fe, Cr) in $NbSe_2$ at relatively large concentrations of approximately 1%. Magnetic measurements show a pronounced magnetic anisotropy of these interstitial alloys, as evidenced in qualitatively different magnetization reversal dynamics for the magnetic fields applied in-plane and out-of-plane of these quasi two-dimensional samples. Element-specific characterization indicates that magnetic dopants are distributed approximately evenly throughout samples, thus ruling out clustering as a primary mechanism behind the observed anisotropy. For an arbitrary orientation of the applied field with respect to the sample plane, an interesting reorientation-like behavior is observed at magnetic fields below the value needed for the magnetization saturation. The details of this reorientation depend on the angle between the applied field and the sample plane. This behavior is temperature dependant, and was observed below the Peierls transition (T_P = 33 K), but above the superconducting transition T_C. We discuss the nature of these measurements in the light of the proposed models of doped $NbSe_2$. This research was supported by the NSF grant (DMR 04-05500). I acknowledge Prof. R. E. Thorne for making samples available, and CCMR staff for assistance.

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