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Magnetic and crystallographic properties of Cr$_{1-x}$Fe$_x$Ge

YUEN YIU, NIRMAL GHIMIRE, DAVID MANDRUS, University of Tennessee, STEPHEN NAGLER, MICHAEL MCGUIRE, Oak Ridge National Laboratory, DAVID MANDRUS COLLABORATION — According to previously published bulk measurements, Cr$_{1-x}$Fe$_x$Ge exhibits a quantum critical point at $x=0.75$, where it turns from a paramagnet (for $x<0.75$) into a ferromagnet (for $x>0.75$). Cr$_{1-x}$Fe$_x$Ge is a simple cubic B20 (FeSi) crystal. The endpoints of the alloy are binary compounds that have been studied to some degree. FeGe, the better known of the two, is a spiral ferromagnet similar to MnSi. However, less is known for CrGe, which is thought to be a weakly ferromagnetic paramagnet with bulk properties that may be explained by the paramagnon theory. We report new neutron scattering results on Cr$_{1-x}$Fe$_x$Ge for $x=0.6, 0.7, 0.75, 0.8$.

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