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Neutron Diffraction Studies of the Quasi-1D Superconductor $K_2Cr_3As_3$ KEITH TADDEI, QIANG ZHENG, ATHENA SEFAT, CLARINA DELA CRUZ, Oak Ridge National Laboratory — The recently discovered $A_2Cr_3As_3$ (with A = K, Rb or Cs) superconductors (with $T_c \sim 7$K and hexagonal space group symmetry $P\bar{6}m2$) offer an exciting new system to study unconventional superconductivity (UNSC). Much like their predecessors — the cuprates and the iron-based superconductors (FBS) — these intercalated CrAs compounds couple superconductivity with reduced dimensionality, an expanded phase space accessible through changing elements in a charge reservoir portion of the structure and the occurrence of magnetic elements which contribute strongly to the Fermi surface. While the latter two of these features strongly suggest the role of magnetism in UNSC and give a tuning parameter with which to study it, the former not only gives rise to interesting phenomena but also, importantly, allows greater accessibility of the material to theoretical and computational treatments. The $A_2Cr_3As_3$ system, therefore, both opens new avenues for the study of UNCS and displays early indications of novel and exotic quantum phenomenon related to their low dimensionality. In this talk, we present preliminary results of neutron scattering experiments exploring the magnetism and structure of polycrystalline $K_2Cr_3As_3$.

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