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Neutron Diffraction Studies of Structural and Magnetic Phase Transitions in Ru Doped [1111] Fe Pnictides[1] YUEN YIU, University of Tennessee- Physics, VASILE GARLEA, STEPHEN NAGLER, Oak Ridge National Laboratory - NSSD, MICHAEL MCGUIRE, BRIAN SALES, Oak Ridge National Laboratory - MSTD, ATHENA SEFAT, DAVID MANDRUS, Oak Ridge National Laboratory - MSTD — We report neutron diffraction studies of pnictide [1111] compounds PrFe(1-x)Ru(x)AsO. The undoped parent compound PrFeAsO undergo transitions from a tetragonal to an orthorhombic crystal structure, as well as transitions to a state of magnetic order. Doping on different sites can induce various ground states, including superconductivity. Here we examine the effect of substitutionally doping Ru for Fe. In particular we report neutron diffraction measurements for PrFe (1-x)Ru(x)AsO with x=0, 0.33 and 0.75. Previous bulk and x-ray measurements (M. A. McGuire et al., J. Sol. St. Chem. 182, 2326 (2009)) have shown that doping with Ru moves the structural transition to lower temperature and can also suppress the magnetic order. The neutron diffraction confirms this and shows no sign of magnetic order down to 4K for x=0.33 or 0.75.

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