

Abstract Submitted
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Helical magnetic ground states in the vicinity of the superconducting state of MnP¹ SACHITH DISSANAYAKE, M. MATSUDA, F. YE, S. CHI, QCMD, Oak Ridge National Laboratory, J.-G. CHENG, Chinese Academy of Sciences, China, J. MA, H. D. ZHOU, University of Tennessee, J.-Q. YAN, MSTD, Oak Ridge National Laboratory, K. MATSUBAYASHI, T. OKADA, J. GOUCHI, Y. UWATOKO, ISSP, University of Tokyo — MnP, the first Mn-based superconductor under pressure, exhibits superconductivity near the critical pressure of 7.5 GPa. It shows a ferromagnetic order followed by a helical order (helical-c) with the spins lying in the ab plane and the helical rotation propagating along c axis at ambient pressure. We performed high pressure single crystal neutron diffraction study up to 7 GPa, which is in the vicinity of the superconducting phase. Our results indicate that the magnetic phase in the vicinity of the superconducting phase has a helical-b structure with the spins lying in the ac plane and the magnetic propagation vector along b axis. Polarized single crystal neutron diffraction measurements at 1.8 GPa confirmed the helicity in the ac plane. With increasing pressure, incommensurability δ increases and the magnetic moment decreases. Furthermore, small lattice anomalies were observed at different magnetic transitions, indicating that magnetoelastic coupling works to stabilize the magnetic order.

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