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Pressure dependence of the magnetic ground states in MnP[1]
SACHITH DISSANAYAKE, MASAAKI MATSUDA, QCMD, Oak Ridge National Laboratory, J.-G. CHENG, Chinese Academy of Sciences, China, F. YE, S. CHI, QCMD, Oak Ridge National Laboratory, J. MA, H. D. ZHOU, University of Tennessee, J.-Q. YAN, MSTD, Oak Ridge National Laboratory, S. KASAMATSU, O. SUGINO, T. KATO, K. MATSUBAYASHI, T. OKADA, Y. UWATOKO, ISSP, University of Tokyo — The newly discovered superconductor MnP shows a ferromagnetic order below $T_C \approx 290$ K followed by a helical order below $T_s \approx 50$ K in ambient pressure. An antiferromagnetic order is suggested in the vicinity of the pressure induced superconducting phase. We have performed single crystal neutron diffraction experiments to determine the magnetic structure under pressure. Both T_C and T_s are gradually suppressed with increasing pressure and the helical order disappears at 1.2 GPa. At intermediate pressures of 1.8 and 2.0 GPa, the ferromagnetic order first develops and is gradually suppressed below a characteristic temperature. At 4 GPa no magnetic signal was observed down to 3.5 K. Our results suggested that the new magnetic phase in the vicinity of the superconducting phase is in a short-ranged magnetic state due to frustration or in an itinerant magnetic state, where the itinerant small Mn moments are weakly interacting.

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Sachith Dissanayake
QCMD, Oak Ridge National Laboratory

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