Abstract Submitted
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Pressure-induced magnetic quantum critical point in the itinerant helimagnet MnP JINGUANG CHENG, Institute of Physics, Chinese Academy of Sciences, KAZUYUKI MATSUBAYASHI, ISSP, University of Tokyo, WEI WU, FUKUN LIN, JIANPING SUN, JIANLIN LUO, Institute of Physics, Chinese Academy of Sciences, YOSHIYA UWATOKO, ISSP, University of Tokyo, JIAQIANG YAN, MASAAKI MATSUDA, Oak Ridge National Laboratory — Manganese monophosphide, MnP, is an interesting magnetic material that has been investigated since 1960s in the context of rich magnetic phase diagram, Lifshitz multicritical point, and magnetocaloric effect [1-4]. It adopts in the orthorhombic *B31*-type structure derived from the hexagonal NiAs-type structure. At ambient pressure, MnP is ferromagnetic between T_c =291 K and $T_s \approx 50$ K, below which the magnetic structure changes into a screw-type order with Mn spins rotating in the a-b plan and propagating along the c axis [1,2]. We have performed comprehensive high-pressure studies on MnP single crystals up to 10 GPa with a suite of experimental probes, including resistivity, ac magnetic susceptibility, neutron diffraction. We found that the application of pressure reduces T_c and alters the ferromagnetic transition to an antiferromagnetic-like state above $\sim$ 3 GPa, and finally suppresses completely the magnetic transition around $P_c \sim$ 7-8 GPa. Exotic properties including the non-Fermi-liquid behavior and dramatic enhancement of effective mass are clearly evidenced near P_c, signaling the occurrence of magnetic quantum critical point. Ref. [1] Phys. Rev. 135, A1033 (1964). [2] JAP 37, 1056 (1966). [3] PRL 44, 1692 (1980). [4] PRB 77, 104439 (2008).

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