

Abstract Submitted  
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**Direct observation of a helical magnetic order near the superconducting state of MnP under pressure** YISHU WANG, California Institute of Technology, YEJUN FENG, Argonne National Lab, J.-G. CHENG, Chinese Academy of Sciences, T. F. ROSENBAUM, California Institute of Technology — A recent high-pressure electrical transport study of the 3d transition metal compound MnP manifested a complex pressure-temperature phase diagram of different types of magnetism and superconductivity. However, the nature of the high-pressure magnetic phase proximate to the superconducting state was not determined. We use non-resonant X-ray magnetic diffraction to probe the magnetic order in MnP under pressure. We discover incommensurate helical order in a confined region under high pressure, and ascertain the phase boundary through the pressure evolution of the lattice. Although the antiferromagnetic and superconducting phases are separated, there is no signature of a strong first-order phase transition between them. We discuss how our direct observation of a helimagnetic order in MnP helps to better understand aspects of magnetically-mediated superconductivity.

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