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Possible spin-momentum locking and band-dependent coherence in Sr3Ru2O7 revealed by angle-dependent magneto thermoelectric measurements CHENYI SHEN, HUI XING, Department of Physics, Zhejiang University, XINXIN CAI, Department of Physics and Materials Research Institute, Pennsylvania State University, DAVID FOBES, Department of Physics, Tulane University, MINGLIANG TIAN, High Magnetic Field Laboratory, Chinese Academy of Science, ZHIQIANG MAO, Department of Physics, Tulane University, ZHUAN XU, Department of Physics, Zhejiang University, YING LIU, Department of Physics and Materials Research Institute, Pennsylvania State University — The bilayer member of the Roddlesden-Popper(R-P) series, Sr3Ru2O7, with its complex phenomena such as a magnetic field orientation dependent metamagnetic transition and the possible existence of a nematic phase, has attracted much attention. Both INS and NMR studies suggested that the metamagnetic transition is band dependent and some bands of Sr3Ru2O7 are heavily renormalized according to the ARPES experiment. However, the underlying electronic and magnetic properties of these bands are yet to be clarified. We explored band dependent electronic and magnetic properties in Sr3Ru2O7 by using angle-dependent magnetoresistance and magneto thermoelectric measurements on crystals cut along two specific crystalline directions and a magnetic field rotating in the ab plane. We found evidence supporting the presence of spin-momentum locking and the emergence of a coherent state with unconventional magnetism phase formed in a two-dimensional band in Sr3Ru2O7.

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