Abstract Submitted
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Characterization of the Structural and Magnetic Symmetries of Sr_2IrO_4 via Nonlinear Optical Spectroscopy[1] DARIUS TORCHINSKY, HAO CHU, California Institute of Technology, TONGFEI QI, GANG CAO, University of Kentucky, DAVID HSIEH, California Institute of Technology — The combination of strong electron-electron interactions and large spin-orbit coupling in the iridates provides a unique platform for realizing exotic electronic phases. A characterization of the structural and magnetic symmetries of these systems is important for understanding whether many of the predicted phases can be realized. Here we discuss how measurement of the nonlinear optical susceptibility using a novel rotational anisotropy technique can be used to study the structural and magnetic symmetries of iridates, which provides a complement to neutron and x-ray diffraction based probes. The perovskite iridate Sr_2IrO_4 in particular has been intensively studied recently owing to its novel J_{eff} =1/2 magnetic Mott insulating ground state, possible unconventional metal-to-insulator transition and potential for high-T_c superconductivity upon doping. We apply our technique to Sr_2IrO_4 to examine both its structural and magnetic symmetries across the Neel transition and discuss our observations in the context of the intriguing physics of these systems.

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