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Raman scattering study of the pressure- and field-dependent phases of Sr_2IrO_4 ¹ Y. GIM, M. KIM, S.L. COOPER, Frederick Seitz Materials Research Laboratory, University of Illinois at Urbana-Champaign, 104 South Goodwin Avenue, Urbana, Illinois 61801-2902, G. CAO, Department of Physics and Astronomy, University of Kentucky, Lexington Kentucky 40506 USA — Transition metal oxides (TMOs) with a perovskite structure are of interest due to the many fascinating phenomena they exhibit. Among TMOs, iridates with 5d orbitals exhibit an unexpected insulating state due to large spin-orbit coupling. With the extended nature of the 5d orbital giving rise to a strong crystal field, the competition between the onsite Coulomb interaction and spin-orbit coupling—which have comparable energy scales—opens up the possibility for studying novel phases that develop when tuning this competition with using an external perturbation with magnetic field or pressure. In this talk we present temperature, magnetic field and pressure dependent Raman study of Sr_2IrO_4 , which provides an opportunity Pressure- and field-tuned Raman spectroscopy provides an opportunity to explore the novel phases of this material under extreme conditions.

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