

Abstract Submitted
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**Isotropic and anisotropic regimes of the spin-dynamics in Sr_2IrO_4
: Field-dependent Raman scattering study**¹ Y. GIM, A. SETHI, Frederick Seitz Materials Research Laboratory, University of Illinois at Urbana-Champaign, 104 South Goodwin Avenue, Urbana, Illinois 61801-2902, Q. ZHAO, J.F. MITCHELL, Material Science Division, Argonne National Laboratory, Argonne, Illinois 60439, USA, G. CAO, Center for Advanced Materials, University of Kentucky, Lexington, Kentucky 40506, USA, S.L. COOPER, Frederick Seitz Materials Research Laboratory, University of Illinois at Urbana-Champaign, 104 South Goodwin Avenue, Urbana, Illinois 61801-2902 — Experimental studies of the strong spin-orbit coupled material, Sr_2IrO_4 , have provided evidence that the spin dynamics of this material can be described by an isotropic two-dimensional effective Heisenberg description. To study how well this description describes the spin-dynamics of Sr_2IrO_4 in different magnetic field regimes, in this talk, we present field-dependent Raman scattering studies of the low-energy spin-dynamics in Sr_2IrO_4 . We find that for $H > 1.5$ T, the spin-dynamics of Sr_2IrO_4 are well described by an isotropic, 2D description. However, at low fields, $H < 1.5$ T, the spin dynamics show evidence for the effects of in-plane anisotropy and interlayer coupling. These effects must therefore be considered when modeling the low-field magnetic and dynamical properties of Sr_2IrO_4 .

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