

Abstract Submitted
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The origin of exciton mass in a frustrated Mott insulator Na_2IrO_3 ¹ ZHANYBEK ALPICH SHEV, EDBERT SIE, FAHAD MAHMOOD², Massachusetts Institute of Technology, GANG CAO³, University of Kentucky, NUH GEDIK, Massachusetts Institute of Technology — We use a three-pulse ultrafast optical spectroscopy to study the relaxation processes in a frustrated Mott insulator Na_2IrO_3 . By being able to independently produce the out-of-equilibrium bound states (excitons) of doublons and holons with the first pulse and suppress the underlying antiferromagnetic order with the second one, we elucidate the relaxation mechanism of quasiparticles in this system. By observing the difference in the exciton dynamics in the magnetically ordered and disordered phases, we found that the mass of this quasiparticle is mostly determined by its interaction with the surrounding spins.

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