

Abstract Submitted
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Effect of spin-orbit coupling on the band structure, magnetic ground states and low energy excitations of double perovskites¹ ONUR ERTEN, ANAMITRA MUKHERJEE, MOHIT RANDEIRA, NANDINI TRIVEDI, PATRICK WOODWARD, The Ohio State University — We investigate a model for double perovskites $A_2BB'O_6$ that describes the coupling of local moments on the B site to itinerant electrons contributed by the B' sites. To model materials like Sr_2CrOsO_6 we examine the role of spin-orbit coupling on the the B' site, which cannot be ignored because of the large Z of Os. First, we present $T = 0$ results for the net moment in the ferrimagnetic state. We show that direct B'-B' hopping plays just as important role as the spin orbit coupling in determining the ordered moment. We use our model Hamiltonian approach to discuss the question of metallic versus insulating ground states, by including the effects of Coulomb U on the spin-orbit split electronic structure. Finally, we investigate the low energy excitations of this model to understand the origin of the experimentally observed nonmonotonic behavior of magnetization as a function of temperature.

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