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Spin waves in half-metallic double perovskite magnets via Dyson's method KELLY REIDY, Kent State University, KATHERINE JONES-SMITH, Oberlin College, HARSH MATHUR, Case Western Reserve University — A new method for treating strongly correlated electronic matter is applied to an idealized model of double exchange magnetism and to the half-metallic double perovskite Sr_2FeMoO_6, a conducting material that is magnetically ordered at room temperature and potentially useful for spintronics. Our method [1] is a supersymmetric generalization of Dyson's analysis of spin waves in ferromagnets wherein quasiparticles are governed by a non-Hermitian Hamiltonian. Using this method, we obtain the spin wave dispersion relation for the idealized model and for the double perovskite material. We also reformulate these problems using a supersymmetric generalization of Schwinger boson mean-field theory. The results will be compared to a semi-classical exact diagonalization Monte-Carlo analysis [2], and broader implications of the method of non-Hermitian quasiparticles will be discussed. [1] Katherine Jones-Smith, Phil. Trans. Roy. Soc. A28, 371 (2012). [2] O. Erten et al., Phys. Rev. Lett. 107, 257201 (2011)

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