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Glassy Spin Freezing and Gapless Spin Dynamics in a Spatially Anisotropic Triangular Antiferromagnet Ag2MnO2 SUNGDAE JI, J.-H KIM, S.-H. LEE, University of Virginia, Y. QIU, M. GREEN, NIST Center for Neutron Research, M. MATZUDA, Japan Atomic Energy Agency, Y. YOSHIDA, Z. HIROI, University of Tokyo, T. ZIMAN, Institut Laue Langevin — We report our elastic and inelastic neutron scattering measurements on a spatially-anisotropic triangular antiferromagnet metal compound of Ag_2MnO_2. Upon cooling, it undergoes a structural phase transition at 540 K from trigonal to monoclinic due to a ferro-orbital order of the Jahn-Teller active Mn^3+ ion resulting in spatially anisotropic magnetic interactions in the triangular plane. Despite the large $T_CW \sim 400$ K, it does not order down to $T_f = 48(6)$ K below which the Mn spins freeze into a collinear spin state with the frozen moment, M = 2.4(2) μ_B/Mn ¡¡ gsμ_B/Mn, and the frozen spin order is short ranged indicating extreme two-dimensional magnetic interaction. Moreover, the two-dimensional spin fluctuations have a gapless spectrum with two characteristic relaxation rates, an overall relaxation rate that behave linearly above freezing temperature . We argue that Ag_2MnO_2 might be an excellent candidate for a gapless spin liquid phase.

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