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Dynamics of the Spin Liquid Phase of Cs_2CuCl_4[1] OOKIE MA, MARC-ANDRE VACHON, VESNA F. MITROVIĆ, BRAD MARSTON, Brown University — The dynamics of a spin-liquid phase of an antiferromagnet on the anisotropic triangular lattice and in a magnetic field are studied with a combination of Gutzwiller-projected wavefunctions and mean-field theory. Candidate ground states that support fermionic gapless spinon excitations include four different U(1) spin liquids[2]. The lattice and the states interpolate between limiting cases of 1D decoupled chains ($J/J' = 0$) and the isotropic 2D square lattice ($J/J' = \infty$). Parameters of the mean field theory are chosen to minimize the ground state energy of the corresponding Gutzwiller-projected wavefunction. The spin-lattice relaxation rate $1/T_1$, calculated within the mean-field approximation, is compared to NMR measurements[3] in the spin liquid phase of Cs_2CuCl_4[4].

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[2]Y. Zhou, X. G. Wen, cond-mat/0210662 (2003).
[3]M. A. Vachon, O. Ma, J. B. Marston, V. F. Mitrović, unpublished (2007).
[4]Y. Tokiwa, T. Radu, R. Coldea, H. Wilhelm, Z. Tylczynski, F. Steglich, PRB 73, 134414 (2006).

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