

Abstract Submitted  
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**Theory of the Valence-Bond-Solid Phase on the Kagome Lattice of Zn-paratacamite** MICHAEL LAWLER, University of Toronto, LARS FRITZ, Harvard University, YONG BAEK KIM, University of Toronto, SUBIR SACHDEV, Harvard University — We present a theory of the valence-bond-solid phase discovered in a recent neutron scattering experiment [1] on Zn-paratacamite,  $\text{Zn}_x\text{Cu}_{4-x}(\text{OH})_6\text{Cl}_2$ , at small  $x$ . A theory of the Neel phase also discovered in this experiment will be presented in a related contributed talk. Zn-paratacamite has been considered as an excellent model system for the kagome lattice of spin-1/2 moments with antiferromagnetic exchange interactions. We study both the classical and quantum Heisenberg models on the distorted kagome lattice appropriate for Zn-paratacamite with small  $x$ . Our theory naturally explains the emergence of the valence bond solid phase. We suggest future inelastic neutron and elastic X-ray scattering experiments that can test our predictions. [1] S.-H. Lee et al., Nature Materials, 6, 853

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