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Local-scale magnetic studies of the condensed valence-bond state in $LiZn_2Mo_3O_8$ JOHN SHECKELTON, The Johns Hopkins University, FRANCESCA FORONDA, Oxford University, LIDONG PAN, The Johns Hopkins University, CAMILLA MOIR, National High Magnetic Field Laboratory, Florida State University, ROSS MCDONALD, National High Magnetic Field Laboratory, Los Alamos National Laboratory, TOM LANCASTER, Durham University, PETER BAKER, ISIS Facility, STFC Rutherford Appleton Laboratory, N. PETER ARMITAGE, The Johns Hopkins University, TAKASHI IMAI, McMaster University, STEPHEN BLUNDELL, Oxford University, TYREL MCQUEEN, The Johns Hopkins University — The reduced molybdenum oxide $LiZn_2Mo_3O_8$ is an insulating material composed of layers of Mo_3O_{13} clusters, with the clusters arranged on a triangular lattice and non-magnetic Li/Zn inter-layers. A formal electron count results in each molybdenum cluster acting as S=1/2 magnetic unit. Superexchange between clusters is mediated through Mo-O-Mo oxo bridges that lead to a frustrated magnetic state. Local-scale magnetic measurements indicate the existence of a gapless spin excitation spectrum that persists down to the lowest temperatures measured. In addition, these local probe measurements indicate local magnetic behavior that corresponds to bulk measurements. The data presented are consistent with expected magnetic responses of a condensed valence-bond state. Structural and measured magnetic properties and ongoing research will be discussed.

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