

Abstract Submitted
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Magnetic excitations in weakly coupled classical and quantum spin systems T. MASUDA, A. ZHELUDEV, Condensed Matter Sciences Division, Oak Ridge National Laboratory, S. IMAI, K. UCHINOKURA, Department of Advanced Materials Science, University of Tokyo, S. PARK, NIST Center for Neutron Research — Magnetic excitations in the ordered state of $\text{Cu}_2\text{Fe}_2\text{Ge}_4\text{O}_{13}$ is studied by inelastic neutron scattering technique. Low energy excitations up to 10 meV is well explained by coupled classical chains of Fe^{3+} . Checkerboard like intensity patterns in wide reciprocal space is reproduced by spin-wave theory including magnetic non-Bravais lattice. The distinct narrow-band excitation at 25 meV is identified as quantum dimer excitation of Cu^{2+} . The cooperative ordering at low temperature is a result of weakly coupling between classical and quantum entities in this compound. This work was carried out under DOE Contract No. DE-AC05-00OR22725.

Takatsugu Masuda
Condensed Matter Sciences Division, Oak Ridge National Laboratory

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