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Field-induced spontaneous magnon decay in a spin-1/2 coupled two-leg ladder antiferromagnet C9H18N2CuBr4 with small Ising anisotropy TAO HONG, Quantum Condensed Matter Division, Oak Ridge National Laboratory, Y. QIU, National Institute of Standards and Technology, D. A. TENNANT, Quantum Condensed Matter Division, Oak Ridge National Laboratory, K. COESTER, K. P. SCHMIDT, Lehrstuhl fur Theoretische Physik I, TU Dortmund, F. F. AWWADI, Department of Chemistry, The University of Jordan, M. M. TURNBULL, Carlson School of Chemistry, Clark University — We present the high-resolution neutron scattering study in magnetic fields applied perpendicular to an easy-axis (Ising type) on the S =1/2 coupled two-leg ladder antiferromagnet (dimethylammonium)(3,5-dimethylpyridinium)$CuBr_4$. At finite fields, the magnetic structure becomes noncollinear canted and the observed intriguing spontaneous magnon decays over a large region of Brillouin Zone in the excitation spectra can be well explained by the mechanism where the process of one-magnon decays into two-magnon continuum is kinematically allowed [1]. [1] M. E. Zhitomirsky and A. L. Chernyshev, Rev. Mod. Phys. **85**, 219 (2013).

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