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Half-Magnetization Plateau in the Pyrochlore Spin-Peierls Model YUKITOSHI MOTOME, RIKEN (The Institute of Physical and Chemical Research), Japan, NIC SHANNON, Max-Planck-Institut für Physik komplexer Systeme, Germany, KARLO PENC, Research Institute for Solid State Physics and Optics, Hungary — We present our theoretical work on the spin-Peierls model on a pyrochlore lattice under the external magnetic field. By using Monte Carlo calculations, we obtain the phase diagram in the parameter space of the temperature, the external magnetic field, and the strength of the spin-lattice coupling. We have found that a collinear trigonal phase with 3-up and 1-down spin configuration in each tetrahedral unit of the pyrochlore lattice, which has been revealed in the mean-field result for the ground state [1], remains robust in a wide regime of the finite-temperature phase diagram. This collinear phase gives rise to a half-magnetization plateau in the magnetization process. The results are compared with the recent experimental results in the chromium spinel oxides, such as  $CdCr_2O_4$  and  $HgCr_2O_4$  [2]. [1] K. Penc, N. Shannon, and H. Shiba, Phys. Rev. Lett. 93, 197203 (2004). [2] H. Ueda et al, unpublished.

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