

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Magnetization plateaus for Cs_2CuBr_4 SHIN MIYAHARA, KIYOSHI OGINO, MASAHIRO SHIMIZU, NOBUO FURUKAWA, Aoyama Gakuin University — Cs_2CuBr_4 is a new two-dimensional spin-1/2 system, where 1/3- and 2/3-plateaus have been observed in external magnetic fields. The magnetic behaviors of the material are well explained by a two-dimensional antiferromagnetic Heisenberg model on a distorted triangular lattice. In the model, there are two types of interactions J_1 and J_2 , where J_1 chains are coupled with inter chain interactions J_2 . Using an exact diagonalization method, we investigated magnetic properties, especially magnetization curve. In the magnetization, 1/3-plateau appears for $0.7 \lesssim J_2/J_1 \lesssim 1.3$. At the plateau, three-fold degenerate ground state, up-up-down structure, is realized. Our results indicate that the material has a more frustrated character $J_2/J_1 \approx 0.7$ than what has been expected from a classical theory $J_2/J_1 = 0.47$. The magnetic properties at 2/3-plateau will also be discussed.

Shin Miyahara
Aoyama Gakuin University

Date submitted: 28 Nov 2005

Electronic form version 1.4