Magnetization plateaus for Cs$_2$CuBr$_4$ SHIN MIYAHARA, KIYOSHI OGINO, MASAHIRO SHIMIZU, NOBUO FURUKAWA, Aoyama Gakuin University — Cs$_2$CuBr$_4$ 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 $0.7 < J_2/J_1 < 1.3$. 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.

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