Rotational symmetry breaking in Heisenberg model on triangular lattice\textsuperscript{1} RYO TAMURA, NAOKI KAWASHIMA, ISSP, University of Tokyo — We study a finite-temperature phase transition in the two-dimensional classical Heisenberg model on a triangular lattice with a ferromagnetic nearest-neighbor interaction $J_1$ and an antiferromagnetic third-nearest-neighbor interaction $J_3$ using Monte Carlo simulation. Apart from a trivial degeneracy corresponding to O(3) spin rotations, the ground state for $J_3 \neq 0$ has a threefold degeneracy corresponding to 120 degree lattice rotations. We find that this model exhibits a phase transition with breaking of the three-fold symmetry when $J_3 = J_1/3$ and that the transition is of the first order.

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