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Magnetic phase diagram slightly below the saturation field in the stacked J1-J2 model in the square lattice with the JC interlayer coupling HIROAKI UEDA, Toyama Prefectural Univ-Imizu — We study the effect of adding interlayer coupling to the square lattice, J_1-J_2 Heisenberg model in high external magnetic field. In particular, we consider a cubic lattice formed from stacked J_1-J_2 layers, with interlayer exchange coupling J_C. For the 2-dimensional model ($J_C = 0$) it has been shown that a spin-nematic phase appears close to the saturation magnetic field for the parameter range $-0.4 \leq J_2/J_1$ and $J_2 > 0$. We determine the phase diagram for 3-dimensional model at high magnetic field by representing spin flips out of the saturated state as bosons, considering the dilute boson limit and using the Bethe-Salpeter equation to determine the first instability of the saturated paramagnet. Close to the highly frustrated point $J_2/J_1 \sim 0.5$, we find that the spin-nematic state is stable even for $|J_C/J_1| \sim 1$. For larger values of J_2/J_1, interlayer coupling favors a broad, phase-separated region. Further increase of $|J_C|$ stabilizes a collinear antiferromagnet, which is selected via the order-by-disorder mechanism.

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