題目：**Quantum fluctuations on triangular lattices of Ising spins**

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場所：**理 4 号館 2 階 1220 号室（対面のみ）**
Room 1220, 2rd floor, Science Bldg. 4 (in-person only)

The effects of introducing quantum fluctuations into spin system with finite entropy in the zero temperature limit are explored using neutron scattering experiments in the single layer and the bi-layer triangular lattice antiferromagnets $K_2Co(SeO_3)_2$ and $K_2Co_2(SeO_3)_3$. The magnetism of both these is based on effective spin-1/2 $3d^7$ Co^{2+} ions with easy-axis antiferromagnetic super-exchange interactions mediated by the selenite polyanion $[SeO_3]^{-2}$.

By probing the distinct static and dynamic spin correlations in $K_2Co(SeO_3)_2$ versus field and temperature we provide evidence for two super-solid phases of bosons with repulsive nearest neighbour interactions on the triangular lattice. There is a field driven transition to a collinear 1/3 magnetization plateau phase wherein the magnetic excitations take the form of coherent spin waves from which we determine the Hamiltonian. A second super-solid phase is found through pulsed field magnetization measurements near the upper critical field.

The bi-layer system $K_2Co_2(SeO_3)_3$ has five magnetization plateau phases. In zero field we find a near equidistant spectrum of non-dispersive modes from which we obtain the dominant exchange interactions. Quasi-long-range $\sqrt{3} \times \sqrt{3}$ order develops at low temperatures though with a gapless excitation spectrum indicative of rotational symmetry breaking. We associate the abrupt decoupling of the Co nuclear spin system from the electronic spin system in the 1/3 magnetization plateau phase with the opening of a gap in the magnetic excitation spectrum, which is also apparent from inelastic neutron scattering.

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