Multi-Magnon Bound States in J1-J2 Model on a Triangular Lattice RINA TAKASHIMA, Kyoto University, HIROAKI ISHIZUKA, LEON BALENTS, KITP, UCSB — Competing exchange interactions in spin systems often give rise to unusual magnetic behavior, such as spiral orders and nematic orders in spin chains. Also, on classical triangular Heisenberg models, recent studies found skyrmion lattice phases in an applied magnetic field. Motivated by these studies, we investigate the magnetic phase diagram of a quantum J1-J2 XXZ model on a triangular lattice. In order to study the quantum phases close to the saturation field, we calculate the low energy excitation spectrum near the saturation field, and find the instability toward condensation of multi-magnon bound states, namely, multi-polar order. A similar behavior is confirmed in the exact diagonalization of finite size clusters. We also discuss the relationship between the obtained quantum phases and the skyrmion lattice phase which is found in the classical counterpart of our model.

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