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Neutron Diffraction on NaNi2BiO6: Complex Interactions on a Honeycomb Lattice[1] ALLEN SCHEIE, Johns Hopkins University, KATE ROSS, Colorado State University, ELIZABETH SEIBEL, Princeton University, JOSE RODRIGUEZ-RIVERA, NIST, COLLIN BROHOLM, Johns Hopkins University, ROBERT CAVA, Princeton University, INSTITUTE FOR QUANTUM MATTER COLLABORATION — Magnetic crystals with a honeycomb lattice can have a very high degree of frustration when next-nearest neighbor interactions are strong. Such complex interactions can lead to Kitaev model physics, including a proposed spin liquid phase. Using neutron scattering, we studied the magnetic properties of a new spin-1/2 honeycomb compound, $NaNi_2BiO_6$, which was known to have heat capacity peaks indicative of a phase transition at 5 K. The magnetic order indicates beyond nearest-neighbor exchange as well as significant inter-plane interaction, which allows for a study of rich and complex structure. In this talk I report the magnetic structure of the compound as found with neutron powder diffraction, and discuss the exchanges necessary to lead to such a complex order.

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