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Orbital and magnetic states in $BaV_{10}O_{15}$ SACHITH DISSANAYAKE, TIANRAN CHEN, Univ of Virginia, JOOSEOP LEE, MATTHEW STONE, MASAAKI MATSUDA, Oak Ridge National Laboratory, TOMOMASA KAZITA, TAKURO KATSUFUJI, Waseda University, SEUNGHUN LEE, Univ of Virginia — $BaV_{10}O_{15}$ is a new type of frustrated magnet that exhibits interesting physics due to its charge and orbital ordering which has an average V valance of 2.8+. The V ions form a lattice with V "boats," each of which is made of five V atoms and connected along ab plane. The system undergoes a structural phase transition at T_s =130 K and shows an antiferromagnetic long range ordering below T_N =43 K. Although there have been several studies about this complex V spin system, nature of the orbital and magnetic correlations is still unclear. In this talk I will discuss about our elastic and inelastic neutron scattering results obtained from a powder sample and a single crystal of $BaV_{10}O_{15}$. We investigated the magnetic ground states of $BaV_{10}O_{15}$ by neutron diffraction refinements and the observed magnetic excitations below 15 meV were analyzed by performing linear spinwave calculations. Another broad high energy excitation around 33 meV was observed at temperatures below the structural transition T_s =130 K. Possible orbital and magnetic states for this complex V spin system will be discussed.

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