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Magnetic structure and excitations in $BaV_{10}O_{15}$ SACHITH DISSANAYAKE, JOOSEOP LEE, KAZUKI IIDA, University of Virginia, MATTHEW STONE, MASAAKI MATSUDA, Oak Ridge National Laboratory, TOMOMASA KAZITA, TAKURO KATSUFUJI, Waseda University, SEUNGHUN LEE, University of Virginia — Recently, new type of frustrated magnets, $BaV_{10}O_{15}$ and $SrV_{10}O_{15}$, were found to exhibit interesting physics due to the magnetic $V^{2.8+}$ ions with mixed valence. Using elastic and inelastic neutron scattering measurements we have examined the magnetic structure and excitations of $BaV_{10}O_{15}$. Magnetic excitations show highly dispersive two modes along c axis. Furthermore, two excitations are dispersionless along the a-axis. And very interestingly, along the b-axis one excitation is dispersionless while the other is strongly dispersive. Magnetic ground state of $BaV_{10}O_{15}$ was studied using neutron powder diffraction data, which order below 45 K with magnetic wave vector Q_m =(1/2 0 0). Here we present the possible magnetic structures of $BaV_{10}O_{15}$ using representation analysis, which can explain both the magnetic diffraction data and the basic features of the magnetic excitations observed in different directions. Linear spinwave calculations were also performed to shed light in understanding an effective spin hamiltonian for this system.

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