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Coexistence of ferromagnetism and superconductivity in CeO0.3F0.7BiS2 JOOSEOP LEE, Oak Ridge National Laboratory, SATOSHI DEMURA, National Institute for Material Science, MATTHEW STONE, Oak Ridge National Laboratory, KAZUKI IIDA, University of Virginia, GEORG EHLERS, CLARINA DELA CRUZ, MASAAKI MATSUDA, Oak Ridge National Laboratory, KEITA DEGUCHI, YOSHIHIKO TAKANO, YOSHIKAZU MIZUGUCHI, National Institute for Material Science, OSUKE MIURA, Tokyo Metropolitan University, DESPINA LOUCA, SEUNGHUN LEE, University of Virginia — Bulk magnetization, transport and neutron scattering measurements were performed to investigate the electronic and magnetic properties of a polycrystalline sample of the newly discovered ferromagnetic superconductor, CeO0.3F0.7BiS2. Ferromagnetism develops below T_{FM}= 6.54(8) K and superconductivity is found to coexist with the ferromagnetic state below T_{SC}= 4.5 K. Inelastic neutron scattering measurements reveal a very weakly dispersive magnetic excitation at 1.8 meV that can be explained by an Ising-like spin Hamiltonian. Under application of an external magnetic field, the direction of the magnetic moment changes from the c-axis to the ab-plane and the 1.8 meV excitation splits into two modes. A possible mechanism for the unusual magnetism and its relation to superconductivity is discussed.

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