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H-T Phase Diagram of Multiferroic Sr2FeSi2O7 JOOSEOP LEE, University of Virginia, TAE-HWAN JANG, YOON HEE JEONG, Postech, SUNG-DAE JI, NAOYUKI KATAYAMA, University of Virginia, KIRRILY RULE, MANH DUC LE, HMI, SUNG CHANG, NCNR, SEUNG-HUN LEE, University of Virginia, SANG-WOOK CHEONG, Rutgers University — Using elastic neutron scattering, we have explored a new multiferroic $Sr_2FeSi_2O_7$ in the phase space of an external magnetic field (H) and temperature (T). At zero field, Sr2FeSi2O7 orders below 6 K into a collinear magnetic structure with a characteristic wavevector of (1,0,0.5). By applying H along the b-axis upto 14 Tesla at low temperatures, we identified four different magnetic phases, consistent with its bulk property data. All the magnetic states have a characteristic commensurate wave vector of either (1,0,0.5) or (1,0,0), indicating the magnetic structures remain collinear at the field-induced phase transitions. We have also determined the spin hamiltonian using inelastic neutron scattering with H = 0.

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