Abstract Submitted
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**X-ray resonance Exchange scattering study of Field induced meta-magnetic phases in $TbNi_2Ge_2$**[1] R. DAS, Z. ISLAM, J.P.C. RUFF, Advanced Photon Source, Argonne National Laboratory, P.C. CANFIELD, Ames Laboratory, Iowa State University — Rare-earth inter-metallic compound, $TbNi_2Ge_2$ is an interesting material for its uniaxial anisotropy and the presence of a number of meta-magnetic phases (MP), which we have investigated using x-ray resonant exchange scattering techniques. Two distinct field induced MPs have been revealed at 5 K for fields below 3 T applied along the c axis. In zero field, the magnetic structure is characterized primarily by commensurate $q_1$=(0,0,0.75), $q_2$=(0.5,0.5,0) and $q_3$=(0.5,0.5,0.5) wave vectors, implying a complex sequence of FM and AFM planes. With increasing magnetic field, a weak (0,0,1) peak starts to evolve reaching a maximum in the first MP (1.2 T < H < 1.6 T) and sharply disappears on entering the second MP (H > 1.6 T). In the second MP, $q_1$ becomes incommensurate, (0,0,0.766), $q_2$ gets strongly suppressed, and $q_3$ peak splits into combination harmonics of $q_1$ and $q_2$. The persistence of AF peaks imply that AF planes are quite robust to spin-flip transitions and MP phases are intricate in nature due to several competing interactions in this compound.

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