Abstract Submitted
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Composition dependence of magnetic order and spin chirality of Kagomé lattices in $BaMn_{1+x}Ru_{5-x}O_{11}$ R-type ferrites[1] JUSTIN WOODS, GANG CAO, SEAN PARKIN, ERIC TEIPEL, LANCE DELONG, University of Kentucky — The effects of atomic disorder on magnetic frustration have not been extensively studied. Single-crystal $BaMn_{2.49}Ru_{3.51}O_{11}$ exhibits three closely-spaced anomalies in the magnetization at temperatures T_1 = 183 K, T_2 = 171 K and T_3 = 128 K, signaling complex magnetic/chiral ordering, due to an interplay between antiferromagnetic correlations, magnetic frustration and non-zero scalar chirality (induced by spin canting) within the hexagonal (Kagomé) ab-plane [1]. We observe that small increases in Ru content change the temperature and nature of the anomalies: A single crystal of composition $BaMn_{1.915}Ru_{4.085}O_{11}$ exhibits anomalies shifted to lower temperatures T_1 = 149 K, T_2 = 90 K and T_3 = 48 K. The anomaly at T_3 is rapidly weakened by fields H >25 Oe applied parallel to the Kagomé plane for both compositions studied; whereas further field increases shift the onset of magnetic order substantially upward to T_1 = 175 K for the higher Ru concentration.

[1] L. Shlyk et al., Phys. Rev. B 81, 014413 (2010).

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