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Magnetic Diffuse Scattering in the Frustrated Kagome Anti-ferromagnet YBaCo_4O_7 PASCAL MANUEL, LAURENT CHAPON, PAOLO RADAELLI, ISIS Facility, Rutherford Appleton Laboratory, JOHN MITCHELL, HONG ZHENG, Materials Science Division, Argonne National Laboratory, 9700 S. Cass Ave, Argonne IL 60439 — Cobalt oxides of composition RBaCo_4O_7 (R=Y, Tb-Lu) crystallize with a lattice structure topologically related to that of the pyrochlore. Considering only the magnetic transition metal sublattice, R-114 appears as Kagome sheets linked by triangular layers and is therefore expected to provide a new materials class for exploring geometric magnetic frustration. We have recently shown that stoichiometric R-114 compound orders antiferromagnetically into a long-range ordered (LRO) structure with features common to the $\sqrt{3}*\sqrt{3}$ negative chirality spin arrangements often found in Kagome net systems. In contrast, small excesses of O added to the system, as little as 0.1, destroys this LRO state. To explore the nature of the frustrated magnetism in this novel system, we have measured magnetic diffuse scattering on YBaCo_4O_7 and $\text{YBaCo}_4\text{O}_{7.1}$ single crystals at the ISIS facility. Large maps of reciprocal space in several planes have been recorded showing a very structured diffuse scattering. The data compared to models obtained by the Monte-Carlo method using the metropolis algorithm, reveal the exact nature of the disordered ground state in this new class of frustrated magnets.

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