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Complex magnetic structure of YBaCo4O7 LAURENT C. CHAPON, ISIS Facility, Rutherford Appleton Laboratory, UK, JOHN F. MITCHELL, Materials Science Division, Argonne National Laboratory, USA, PAOLO G. RADAELLI, ISIS Facility, Rutherford Appleton Laboratory, UK — The new series of mixed-valent oxides RBaCo4O7 (R=Yb,Tb,Y) show complex structural and magnetic behavior. We have recently revealed, for the Yb analog, that a structural phase transition occurs in response to an extremely underbonded Ba2+ site. The symmetry lowering from orthorhombic to tetragonal, releases the frustration and allows the system to order magnetically below 80K. Here we present our neutron diffraction study of the analog compound YBaCo4O7, that shows the same structural phase transition at high temperature and a magnetic transition at around 110K, where the system orders antiferromagnetically with propagation vector $k=0$. The magnetic structure, solved by global optimization algorithms, shows a non colinear Co-spins arrangement that results from the unique topology of the Co interactions. The magnetic structure is found to be strongly temperature dependent between 1.6K and 110K, which provide crucial information about the relative strengths of competing interactions.

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