

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Magnetic Phase Diagram of $\text{Co}_3\text{V}_2\text{O}_8$ FEI YEN, BERND LORENZ, Y. Q. WANG, Y. Y. SUN, C. W. CHU¹, University of Houston/TCSUH — Kagomé-staircase lattice structures like $\text{Ni}_3\text{V}_2\text{O}_8$ and $\text{Co}_3\text{V}_2\text{O}_8$ have recently attracted attention because of their complex magnetic phase diagrams and the magnetically induced ferroelectric (FE) phase observed in $\text{Ni}_3\text{V}_2\text{O}_8$. $\text{Co}_3\text{V}_2\text{O}_8$ at zero magnetic field exhibits five subsequent magnetic phase transition in a narrow temperature range. It has an incommensurate antiferromagnetic phase below $T_N=11.4$ K and weak ferromagnetic behavior along the a-axis at $T_C=6.2$ K. Along with three other phase transitions in between; $T_1=8.9$ K, $T_2=7.0$ K and $T_3=6.9$ K, the evolution of these five phase transitions under magnetic field, phase boundaries, is traced through magnetic susceptibility and dielectric constant anomalies. We resolve the complete magnetic phase diagram of $\text{Co}_3\text{V}_2\text{O}_8$ with the magnetic field applied along the principal crystallographic orientations.

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Date submitted: 02 Dec 2006

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