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**Tuning Physical Properties via Isovalent Doping in  $\text{Ba}_{2-x}\text{Sr}_x\text{CoO}_4$** <sup>1</sup> HAO SHA, JIANDI ZHANG, Department of Physics, Florida International University, Miami, FL 33199, Q. HUANG, NIST Center for Neutron Research, Gaithersburg, Maryland 20899, V.O. GARLEA, B.C. SALES, D. MANDRUS, R. JIN, Oak Ridge National Laboratory, Oak Ridge, TN 37831 — It is known that monoclinic  $\text{Ba}_2\text{CoO}_4$  is an antiferromagnetic (AFM) insulator with Neel temperature  $T_N=25\text{K}$ . We found that isovalent Sr substitution for Ba drastically changes the structural and magnetic properties of  $\text{Ba}_{2-x}\text{Sr}_x\text{CoO}_4$  system. With increasing  $x$ ,  $T_N$  initially increases then decreases after reaching the maximum at  $x=0.5$ . Correspondingly, its crystal structure changes from monoclinic ( $x < 0.5$ ) to orthorhombic ( $x \geq 0.5$ ) at room temperature. The correlation between structure and physical properties will be discussed.

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