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Effect of uniaxial strain on structural and magnetic phase transitions in Ba $(Fe_{1-x}Co_x)_2As_2$($0 \leq x \leq 0.04$) CHETAN DHITAL, Boston College, ZAHRA YAMANI, CNBC, Chalk River Canada, ZHENSONG REN, TOM HOGAN, Boston College, MASA MATSUDA, ORNL, Oakridge, STEPHEN WILSON, Boston College, BOSTON COLLEGE TEAM — Most of the parent compounds of iron based superconductors have either simultaneous or nearly simultaneous structural and magnetic transitions from the high temperature paramagnetic tetragonal phase to the low temperature orthorhombic antiferromagnetic phase. Different measurement probes either directly/indirectly using uniaxial strain (dc transport, optical, thermodynamic and spectroscopic) indicate the presence of a high-temperature electronically anisotropic, nematic phase in both doped and undoped iron pnictide compounds which persists well beyond the nominal magnetic and structural transition temperatures. Here we will discuss the influence of uniaxial strain on the magnetic and structural transition temperatures across a series of Ba $(Fe_{1-x}Co_x)_2$ As_2 ($0 \leq x \leq 0.04$) single crystals studied via elastic neutron diffraction. We will present in detail how the effect of strain field varies as function of concentration of cobalt and discuss the relevance of our result to the previously observed electronic anisotropies.

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