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STM Studies of the Lattice Distortion at the Surface of $\mathbf{Ba(Fe_{1-x}Co_x)_2As_2}$ SHUHENG PAN, ANG LI, Department of Physics and Texas Center for Superconductivity, University of Houston, JIHUA MA, Department of Physics and Texas Center for Superconductivity, University of Houston/Department of Physics, Boston College, A. SEFAT, M. MCGUIRE, B. SALES, D. MANDRUS, Oak Ridge National Laboratory, R. JIN, E. PLUMMER, Department of Physics and Astronomy, Louisiana State University — At low temperatures the bulk of the iron pnictides such as $Ba(Fe_{1-x}Co_x)_2As_2$ goes from an orthorhombic structure phase to the tetragonal phase with doping. This phase transition is also accompanied by a magnetic phase transition. These phenomena have been discussed in the context of the mechanism of superconductivity in the iron pnictides. With careful examination of our low temperature STM topographic images on the single crystals of $Ba(Fe_{1-x}Co_x)_2As_2$, we found thatthe lattice distortions of the two observed surface structures, namely "Root 2" and "1×2", evolve with doping concentration x across the superconducting dome. Starting from parent compound, the orthorhombic "Root 2" structure evolves towards rhombic, while the "1×2" structure evolves from rhombic to orthorhombic. We will discuss the implications of such doping dependent lattice distortion.

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