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Doping dependence of nematicity in $NaFe_{1-x}Co_xAs$ imaged with scanning tunneling spectroscopy ETHAN ROSENTHAL, ERICK ANDRADE, CARLOS ARGUELLO, Columbia University, RAFAEL FERNANDES, University of Minnesota, LI-YING XING, XIAN-CHENG WANG, CHANG-QING JIN, Institute of Physics, Chinese Academy of Sciences, ANDREW MILLIS, ABHAY PASUPATHY, Columbia University — Multiple experiments have found evidence for broken C_4 rotational symmetry (nematicity) in the electronic structure of iron-based superconductors above the bulk magnetic and structural transition temperatures and across the doping phase diagram. Deducing the relationship between this broken symmetry state and the proximal superconducting state is essential to understanding the nature of the unconventional superconductivity. Many aspects of the nematic state still remain unknown given the bulk-probing nature of many measurements and their inability to probe beneath the superconducting dome. We use atomic-resolution, scanning tunneling spectroscopy (STS) to examine electronic nematicity across the phase diagram in $NaFe_{1-x}Co_xAs$. We find that electronic anisotropy persists both above and below the superconducting dome from the parent compound to the overdoped regime. The strength of the nematicity decreases with increased doping and finally disappears in heavily doped, non-superconducting samples. With the spectral resolution of STS, we will discuss the energy dependence of the nematicity, as well as its interplay with magnetic and superconducting order.

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