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Divergent nematic charge susceptibility in iron-pnictide¹ YANN GALLAIS, LUDIVINE CHAUVIÈRE, YANXING YANG, MARIE-AUDE MÉASSON, MAXIMILIEN CAZAYOUS, ALAIN SACUTO, Université Paris Diderot, DOROTHÉE COLSON, SPEC CEA Saclay, PARIS DIDEROT COLLAB-ORATION, CEA COLLABORATION — We report doping dependent low energy Electronic Raman Scattering measurements in the normal state of $Ba(Fe_{1-x}Co_xAs)$ ₂ stress-free twinned single crystals. The Raman response shows a systematic increase at low energy upon approaching the magneto-structural transition. This quasi-elastic peak displays a distinct symmetry dependence which links it to the nematic charge response in the x^2-y^2 symmetry channel, indicating an incipient tetragonal symmetry breaking instability in the charge sector. The extracted static nematic charge response shows Curie - Weiss behavior above the magneto-structural transition with a characteristic temperature which decreases with doping. These results allow us to disentangle the respective roles of spin, charge and lattice degrees of freedom in the mechanism of tetragonal symmetry breaking in iron-pnictides superconductors.

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