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Nonlinear Elastoresistivity Response in the A_{1g} Symmetry Channel of the Iron Superconductor $Ba(Fe_{0.975}Co_{0.025})_2As_2$ JOHANNA C. PALMSTROM, Stanford University, JIUN-HAW CHU, Stanford University and University of Washington, IAN R. FISHER, Stanford University — Elastoresistivity relates changes in resistance of a material to strains that it experiences. Previously we have shown how the B_{2g} component of the elastoresistivity tensor is proportional to the nematic susceptibility, and hence can be used to infer a divergence of the nematic susceptibility approaching the tetragonal-to-orthorhombic structural phase transition in the Fe-based superconductors. In this talk I will introduce a new application of elastoresistance measurements for probing the resistivity response in the A_{1g} symmetry channel. This is not a nematic symmetry; rather, it describes the isotropic response to strains that the material experiences. This technique was performed on a stereotypical iron based superconductor, $Ba(Fe_{0.975}Co_{0.025})_2As_2$. We find that the response in the A_{1g} channel is nonlinear with a quadratic elastoresistance coefficient that diverges close to the tetragonal to orthorhombic structural transition. I will explain the significance of these measurements and how they fit with our understanding from previous measurements of the B_{2g} elastoresistance response.

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