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Nematic charge fluctuations in iron-based superconductors by Raman scattering

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Electronic analogues of nematic states, in which rotational symmetry is broken but translational invariance is preserved, have been proposed in a variety of correlated materials, such as quantum Hall systems, cuprates, ruthenates, heavy fermions, and, more recently, iron based superconductors. In the iron-based superconductors (Fe SC) several experiments have collected evidence that the tetragonal- to-orthorhombic structural transition is driven not by the lattice, but by electronic nematicity. However it remains a challenge to disentangle the roles of the lattice, spin and charge/orbital degrees of freedom in driving the nematic instability. In my talk I will discuss electronic Raman scattering measurements which demonstrate the presence of charge nematic fluctuations in the tetragonal phase of several Fe SC systems. I will discuss the implications of our results for the mechanism of the nematic/orthorhombic transition in these systems.