Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

The relationship between static and dynamic nematic susceptibility studied by low-energy Raman spectroscopy[1] W.-L. ZHANG, S.-F. WU, GIRSH BLUMBERG, Rutgers University, P. RICHARD, H. DING, Chinese Academy of Sciences, ATHENA S SEFAT, Oak Ridge National Lab — The critical nematic fluctuations are widely observed in many iron-based superconductors and are related to the superconductivity [1]. Both Raman susceptibility and elastic shear modulus C_{66} show evidence of XY quadrupolar nematic fluctuations near the nematic instability. However, while the dynamic Raman response and the static C_{66} data exhibit apparent different temperature dependence, similar critical temperatures were derived from both measurements [2,3]. Here we measure and analyze ultra-low frequency Raman susceptibility in $BaFe_2As_2$, which we compare to the C_{66}, and demonstrate consistency between the dynamic and static nematic susceptibilities, with accounting for the ultra-low frequency spectral weight in the Raman response, which was missed in the prior studies. [1] H.-H.Kuo *et al.*, Science **352**, 958 (2016). [2] Y.Gallais *et al.*, Phys.Rev.Lett. **111**, 267001 (2013). [3] A.E.Bohmer *et al.*, Phys.Rev.Lett. **112**, 047001 (2014).

[1]Work at Rutgers is supported by the U.S.DOE BES DE-SC0005463 and at CAS by MoST(2011CBA001001) and NFSC(11274362) of China.

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Date submitted: 11 Nov 2016 Electronic form version 1.4