

Abstract Submitted
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Collective excitations in AFe₂Se₂ superconductors: application to Raman¹ MAXIM KHODAS, Univ of Iowa, ANDREY CHUBUKOV, Univ of Wisconsin — We present studies of Raman scattering in A_xFe_{2-y}Se₂ (A=K,Rb,Cs) superconductors with only electron pockets. The pairing symmetry consistent with both ARPES and neutron scattering is hybridization induced s^{+-} state. Such order parameter changes sign between the hybridized pockets. The peak in calculated B_{2g} Raman intensity signifies the in-gap charge excitation of a d -wave symmetry. A single B_{2g} mode emerges as a result of strong mixing between the d -wave superconducting fluctuations (Bardasis-Schrieffer modes) and the charge nematic fluctuations. Increase in pocket ellipticity promotes d -wave ordering. As a result the B_{2g} Raman mode softens, and becomes critical at the transition to an $s + id$ state with broken time reversal symmetry. The reported B_{2g} excitation corresponds to the in-gap feature in experimentally observed Raman spectra.

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