

Abstract Submitted
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Observation of Raman active phonon with Fano lineshape in quasi-one-dimensional superconductor $K_2Cr_3As_3$ W.-L. ZHANG, H. LI, X. DAI, H.W. L, Y.-G SHI, J.L. LUO, JIANGPING HU, P. RICHARD, H. DING, Chinese Academy of Sci (CAS), EXTREME CONDITION TEAM, CONDENSED MATTER THEORY TEAM — We study the polarization-resolved phononic Raman scattering in the recent discovered quasi-one-dimensional superconductor $K_2Cr_3As_3$. With support from first-principles calculations, we characterize several phonons, among which one mode has a Fano lineshape, indicative of an electron-phonon coupling. While the common expectation of an electron-phonon coupling is the conventional superconducting mechanism, we show that this mode is related to the in-plane Cr vibration, which modulates the exchange coupling between the first nearest Cr neighbors. Our result support the presence of magnetic fluctuations coupled to the electrons *via* the lattice. We acknowledge MOST (2010CB923000, 2011CBA001000, 2011CBA00102, 2012CB821403 and 2013CB921703), NSFC (11004232, 11034011/A0402, 11234014, 11274362 and 11474330) of China and by the Strategic Priority Research Program (B) of the Chinese Academy of Sciences, Grant No. XDB07020100.

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