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.