## Abstract Submitted for the MAR13 Meeting of The American Physical Society

High-pressure Raman scattering spectrum of  $K_{0.74}Fe_{1.67}Se_{1.6}So_{1.6}So_{1.6}$  YONGHUI ZHOU<sup>1</sup>, LI LI, ZHAORONG YANG, YUPING SUN, Key Laboratory of Materials Physics, Institute of Solid State Physics, Chinese Academy of Sciences, Hefei 230031, China, YUHENG ZHANG<sup>2</sup>, High Magnetic Field Laboratory, Chinese Academy of Sciences, Hefei 230031, China, XIAO-JIA CHEN, HO-KWANG MAO, Geophysical Laboratory, Carnegie Institution of Washington, Washington, DC 20015, USA — We perform high-pressure Raman scattering measurements on  $K_{0.74}Fe_{1.67}Se_{1.6}S_{0.4}$  single crystal up to 20 GPa at room temperature. Anomalous changes of both the  $A_g$  and  $B_g$  phonon modes are found at a critical pressure around 5.0 GPa. Above this pressure, all Raman modes exhibit a hardening behavior at higher pressures. The superconducting transition temperature of this compound was observed to decrease with increasing pressure and vanish at the critical pressure. These results suggest that the lattice modification and the associated electronic structure are important to understand the superconductivity in the FeSe-based superconductors.

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