Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

High-pressure electronic phase diagrams in $\mathbf{FeSe_{1-x}S_x}$ superconductors KOHEI MATSUURA, YUKI ARAI, SUGURU HOSOI, KOUSUKE ISHIDA, YUTA MIZUKAMI, The University of Tokyo, TATSUYA WATASHIGE, SHIGERU KASAHARA, YUJI MATSUDA, Kyoto University, NAOYUKI MAEJIMA, AKIHIKO MACHIDA, TETSU WATANUKI, The National Institutes for Quantum and Radiological Science and Technology, TATSUO FUKUDA, Japan Atomic Energy Agency, YOSHIYA UWATOKO, TAKASADA SHIBAUCHI, The University of Tokyo — The spin fluctuations are believed to be related to the mechanism of the unconventional superconductors. On the other hand, many recent studies suggest that the nematic order that spontaneously breaks rotational symmetry of the system exists in the Fe-based superconductors and its quantum fluctuations may play an essential role for the superconductivity. However, this remains unclear because the nematic order usually coexists with the magnetic order. To solve this issue, FeSe exhibiting a nonmagnetic nematic order is a key system. Under pressure, this order is suppressed and concurrently magnetic order appears, which competes with high-T_c superconducting phase. In isovalent substitution system $FeSe_{1-x}S_x$, we found a nonmagnetic nematic quantum critical point. Here we report our recent high-pressure studies in high-quality single-crystalline $FeSe_{1-x}S_x$ up to 8 GPa. We find a systematic change of the pressure phase diagram in FeSe by the S-substitution. Our results imply that the respective role of nematic and magnetic fluctuations can be elucidated from the precise control of pressure and substitution in this system.

Kohei Matsuura
The University of Tokyo

Date submitted: 11 Nov 2016 Electronic form version 1.4