

## Quantum Criticality and Superconductivity in $\text{SmFe}_{(1-x)}\text{Co}_x\text{AsO}$

H. Kaneko<sup>a</sup>, Y. Yun<sup>a</sup>, N. Shumsun<sup>a</sup>, A. Savinkov<sup>a</sup>, H. Suzuki<sup>a</sup>, Y.K. Li<sup>b</sup>, Q. Tao<sup>b</sup>, G.H. Cao<sup>b</sup>, and Z.A. Xu<sup>b</sup>

<sup>a</sup>Department of Physics, Kanazawa University, Kakuma-machi, Kanazawa 920-1192 Japan

<sup>b</sup>Department of Physics, Zhejiang University, Hangzhou 310027, China

One of the iron pnictide superconductors,  $\text{SmFe}_{(1-x)}\text{Co}_x\text{AsO}$  shows a domelike  $T_C$  curve against Co concentration  $x$ . The parent compound  $\text{SmFeAsO}$  shows the crystal structure transition and an antiferromagnetic (AFM) ordering. With increasing  $x$ , the structural transition temperature  $T_D$  and AFM  $T_N$  decrease and reach 0 K at the critical concentration  $x_C$ . It is not so clear that the critical concentrations for  $T_D$  and for  $T_N$  coincident to each other or not. In our present report we investigated the structural transition by the low temperature x-ray diffraction and the AFM ordering and the superconductive transition by measuring magnetization using the SQUID magnetometer, MPMS. We determined the phase diagram of  $T_D$ ,  $T_N$  and the superconductive transition temperature  $T_C$  against the Co concentration  $x$  near the critical concentration  $x_C$  precisely. We found that the maximum of  $T_C$  in domelike shape locates near the critical concentration  $x_C$ , suggesting the QCP. We will also discuss the quantum fluctuation of the structure change.