

Study of Magnetic Excitation Spectra of Several Fe-pnictide Systems

M. Sato^{*,a,b,e}, T. Kawamata^{†,b,e}, Y. Kobayashi^{b,e}, Y. Yasui^{b,e}, T. Iida^b, S. Suzuki^b, M. Itoh^{b,e}, T. Moyoshi^c, K. Motoya^c, R. Kajimoto^{*,d}, M. Nakamura^d, Y. Inamura^d, and M. Arai^d

^aToyota Physical and Chemical Research Institute, Nagakute, Aichi 480-1192, Japan

^bDepartment of Physics, Nagoya University, Furo-cho, Chikusa-ku, Nagoya 464-8602, Japan

^cDepartment of Physics, Tokyo University of Science, Noda 278-8510, Japan

^dMaterials and Life Science Division, J-PARC Center, JAEA, Tokai 319-1195, Japan

^eJST TRIP, Furo-cho, Chikusa-ku, Nagoya 464-8602, Japan

Magnetic excitation spectra $\chi''(\mathbf{Q}, \Delta E)$ have been measured for several Fe-pnictides including Ca-Fe-Pt-As system ($T_c \sim 30$ K), one of new superconducting systems with FeAs planes. For the system, data were taken with the neutron spectrometer 4SEASONS at J-PARC for a large crystal. Although $\chi''(\mathbf{Q}, \Delta E)$ are enhanced with decreasing temperature T through T_c in the broad energy (ΔE) region around ~ 12.5 meV, it is not significant as compared with the sharp and strong enhancement in the \mathbf{Q} and ΔE spaces predicted for the s_{\pm} symmetry, indicating that the observed shape of $\chi''(\mathbf{Q}, \Delta E)$ is intrinsic, and difficult to explain, unless the s_{++} symmetry is introduced.

*present address: Research Center for Neutron Science and Technology, Comprehensive Research Organization for Science and Society, 162-1 Shirakata, Tokai, Ibaraki 319-1106, Japan.

†present address: Department of Applied Physics, Graduate School of Engineering, Tohoku University, Sendai 980-8578, Japan.