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Spin fluctuations of BaFe2(As,P)2 studied by neutron scattering

CHUL-HO LEE, AIST, Japan, P. STEFFENS, ILL, France, N. QURESHI, Universitat zu Koln, K. KIHOU, M. NAKAJIMA, A. IYO, H. EISAKI, AIST, Japan, M. BRADEN, Universitat zu Koln — Superconductivity can be induced in parent compounds of iron-based superconductors by several methods: carrier doping, external pressure and chemical pressure. To understand their superconducting mechanism, clarifying what is a common property for achieving high-Tc superconductivity is crucial. To date, studies on spin fluctuations have been mainly performed on carrier doped samples. On the other hand, there are only a few studies on chemical pressurized samples examined by powder samples. In this work, thus, we studied spin fluctuations of P doped $BaFe_2(As,P)_2$ (T_c = 29.5K) using single crystal samples. Inelastic neutron scattering measurements were conducted using triple axis spectrometer IN8 of ILL. As results, well-defined commensurate peaks have been observed at (0.5,0.5,L), which is consistent with the nesting vector of the Fermi surface. Energy spectrums at $T = T_c$ show L dependence, suggesting a three dimensional character remains even in superconducting $BaFe_2(As,P)_2$. Clear spin gap has been observed below T_c, whose gap structure depends on L. Details will be discussed at the conference.

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