Spin fluctuations of BaFe$_2$(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)$_2$ ($T_c = 29.5$K) 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.