Pulsed Neutron Scattering Study of Magnetic Excitation in Dilute-Doped Bi2201-System

Department of Physics, Tohoku University, IMR, Tohoku University A, Kyushu Institute of Technology B, KEK C.

Spin correlation on CuO2 plane

Super exchange constant J is determined by electron hopping parameter t & Coulomb interaction U

Current research

Comparison between LSCO with YBCO

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Hourglass excitation has been observed in the two systems, however, the universality is not yet clear due to the different crystal structure.

Motivation

Comparing with LSCO, showing universality of high energy excitation, we prepared dilution doped sample because of clearly magnetic excitation being observed in low energy region.

Set up

- Sample: Bi2.4Sr1.6CuO6+d
- Volume: about 27g
- Temperature: 7K
- Ei=40, 70, 120, 240 [meV]
- Equipment: ISIS-Merlin
- Easily observed wide q-w range

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Bi2201 dispersion has extreme spread about high energy region ~100meV

**Summary**

Dilution doping Bi2201, we first observed magnetic excitation ~160meV. Increasing energy transfer, magnetic peak extreme broadening, and intensity being weak. This result shows that Bi2201 has large J but not collective excitation. Mechanism of high-Tc superconductor cuprates might be common with large J of magnetic excitation.