固体分光 I　擬一次元 NaV_2O_4 の高分解能 ARPES

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Angle-resolved photoemission study of quasi-one-dimensional metallic compound NaV_2O_4

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It is recently reported that a newly synthesized vanadium oxide NaV_2O_4 takes a quasi-one-dimensional (1D) metallic ground state at low temperatures [1]. Our previous photoemission measurements have revealed the power-law behavior near Fermi level (E_F) characteristic of the quasi-1D materials [2]. To clarify the quasi-1D correlation in NaV_2O_4, it is strongly desired to clarify the momentum dependence of the electronic structure near E_F.

We have carried out an angle-resolved photoemission spectroscopy (ARPES) study of NaV_2O_4. The ARPES spectra at 20 K reveal a clear dispersive feature within 0.3 eV of E_F and a Fermi surface crossing along the chain direction with the absence of a Fermi edge. As seen in **Fig. 1**, the Fermi surface mapping gives an open Fermi surface with a finite curvature perpendicular to the chain direction. The Fermi surface topology not only provides direct evidence for the quasi-1D correlation in NaV_2O_4, but also reveals the existence of finite interchain hopping, which leads to weak but finite spectral weight at E_F. We also compared the experimental band structure with the local spin density approximation band calculations at the ferromagnetic and nonmagnetic states. The experimental bands can be well understood based on the moderate exchange splitting.

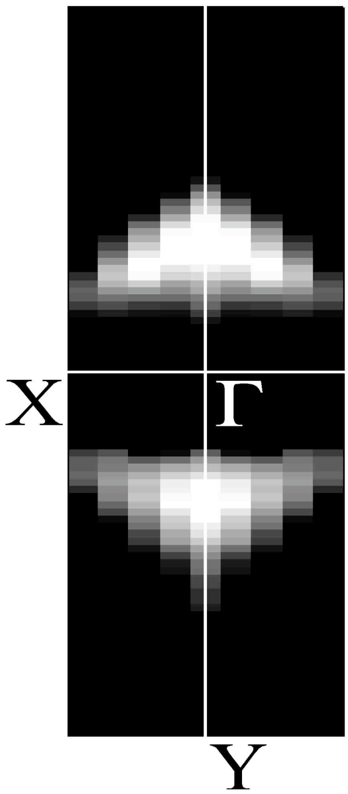

Fig. 1. Experimental Fermi surface of NaV_2O_4 measured at 20 K with 100-eV photon energy.

[1] K. Yamaura *et al.*, Phys. Rev. Lett. **99**, 196601 (2007).

[2] T. Qian *et al.*, J. Phys. Soc. Jpn. (in press).