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Persistence of Dirac Node near Antiferromagnetic-to-Superconducting Phase Boundary in $Ba(Fe_{1-x}Co_x)_2As_2$ HITOSHI TAKITA, NAOYA KISHIMOTO, YOUSUKE NAKASHIMA, Hiroshima University, AKIHIRO INO, MASASHI ARITA, HIROHUMI NAMATAME, MASAKI TANIGUCHI, Hiroshima Synchrotron Radiation Center, YOSHIHIRO AIURA, IZUMI HASE, HIROSHI EISAKI, KUNIHIRO KIHOU, CHUL-HO LEE, AKIRA IYO, National Institute of Advanced Science and Technology, MASAMICHI NAKAJIMA, Osaka University, SHIN-ICHI UCHIDA, University of Tokyo, HIROSHIMA UNIVERSITY TEAM, HIROSHIMA SYNCHROTRON RADIATION CENTER TEAM, NATIONAL INSTITUTE OF ADVANCED SCIENCE AND TECHNOLOGY TEAM, OSAKA UNIVERSITY TEAM, UNIVERSITY OF TOKYO TEAM — Since the ground state of iron-pnictides changes from an antiferromagnetic (AF) phase to a superconducting (SC) phase, the evolution of electronic structure has attracted much attention. However, systematic investigation has been hindered by the intricate multiple bands arising from the orbital degree of freedom of iron $3d$ states. Here we performed a polarization-dependent ARPES study of $Ba(Fe_{1-x}Co_x)_2As_2$ across the AF-SC phase boundary. The doping-dependence of ARPES spectra has shown that the Dirac node reported in the AF phase of $BaFe_2As_2$ persists in $x = 0.04$ near the AF-SC phase boundary, and that it disappears in the SC phase of $x = 0.05$. We parametrized the cone-like dispersion in $x = 0.04$. The polarization-dependence of our ARPES spectra is consistent with the view that the Dirac node is protected by Berry phase arising from orbital degree of freedom under the inversion symmetry.

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