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Impurity-effect on the electronic structure in $Bi_2Sr_2CaCu_2O_{8+\delta}$ studied by angle-resolved photoemission spectroscopy

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We studied the impurity effect on the electronic structure near the Fermi level in $Bi_2Sr_2CaCu_2O_{8+\delta}$ by high-resolution angle-resolved photoemission spectroscopy to clarify the origin of dispersion kink in high-T_c superconductors. We found that the dispersion kink at the off-nodal region is significantly suppressed by Zn or Ni impurity while that at the node is less affected. The impurity-induced change of the self-energy and its temperature dependence show a good correspondence to those of the magnetic excitation of $Q = (\pi, \pi)$, suggesting that electrons are strongly coupled to the spin fluctuation at the antinodal region.

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