

Abstract Submitted
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Analyzing of Superconductivity from Fitting Result of the Diverging Effective Mass in $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$ HYUN-TAK KIM, MIT Center in ETRI, South Korea — For cuprate superconductors, the mechanism of high- T_c superconductivity is still an unclear and unsolved problem, because they are inhomogeneous. Here, we show analysis of superconductivity from the fitting result of the diverging-effective mass (DEM) extracted from the quantum-oscillation data in $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$ [1]. The fitting was performed by extended Brinkman-Rice picture [2]. The fitting result presents the Fermi arc observed by angle-resolved-photoemission-spectroscopy data is presented. In particular, the growing Fermi arc from the nodal Fermi point to the isotropic Fermi surface with increasing x and the nodal constant Fermi energy are revealed. Further, pairing symmetry of cuprate superconductors is analyzed as s -wave. The quantum critical point is regarded as the nodal Fermi point. The intrinsic superconducting gap is formed at node. The mass divergence is an average effect and the true effective mass is constant.

[1] PNAS 107 (2010) 6179.

[2] Physica C 341-348(2000)259; e-print arXiv:cond-mat/0110112; Physica C 460–462, 1076 (2007).

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