

Abstract Submitted
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Pair hopping mechanism of enhancement in T_c for layered superconductors KOICHI KUSAKABE, Osaka University — Two body effective interactions coming from the quantum charge fluctuation may induce pairs tunneling between adjacent layers in high- T_c materials including cuprates, iron-pnictides, MgB₂, and MNX. This mechanism [1] is favored when 1) the one-body Hamiltonian shows negligible inter-layer single electron hopping for the 2D liquid around the Fermi level, and 2) unfilled extended orbitals support the pair tunneling via local two-electron scattering. Localized nature of the 2D liquid is essential. The density functional theory (DFT) can prove this picture in two steps. The Kohn-Sham scheme tells that the single-particle effective Hamiltonian possess these aspects most clearly for the highest T_c material. The multi-reference generalization of DFT allows us to evaluate existence and relevance of the super pair tunneling. A possible mechanism for layered organic superconductors is also discussed.

[1] K. Kusakabe, *J. Phys. Soc. Jpn.*, **78** (2009) 114716.

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