

Abstract Submitted  
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**Theory of Photoemission Line Shape in High Temperature Superconductor  $Bi_2Sr_2CaCu_2O_{8+\delta}$  via Dipolon Mediated Electron-Electron Pairing Mechanism** RAM SHARMA, University of Illinois at Chicago — Observed photoemission (PE) line shape near  $(\pi,0)$  in superconductor BISCCO containing a peak, a dip and a broad feature has been explained naturally by dipolon pairing mechanism using temperature dependent expressions [1,2] including all necessary and important electron correlations. The calculated positions of the peak, dip and broad feature agree well with the observed results. The theory predicts the possibility of observing dipolon side bands in PE. Contributions not only from nearest  $Cu - O_2$  layer but also from all other layers and rows are important. The peak in PE is due to excitation solely of a quasiparticle; the broad feature and dip are due to the excitations of quasiparticles with concomitant O(1,1) and O(1,2) dipolon excitations. In normal state PE [3] of UD, Op and OD samples we have identified these dipolon excitations. Matrix element effects have been considered.

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- [2] R. R. Sharma, Physica **C 439**, 47 (2006).
- [3] Y.-D. Chuang, Phy. Rev. **B 69**, 094515 (2004).

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