Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Prediction of Properties of Pseudo-(Symmetric) State of High Temperature Superconductors RAM R. SHARMA, University of Illinois at Chicago — Recently the dipolon theory [1-4] has predicted [5] new very low energy excitations in HTSCs due to transition of quasiparticles (QPs) from anti-symmetric ("as") to symmetric ("s") state (or vice versa) which creates (annihilates) the quantum ("asson") of energy $\hbar\omega_a(\vec{q}_a) = E^s(\vec{k'}) - E^{as}(\vec{k"})$; "a" stands for "asson" and $E^s(\vec{k'})$ and $E^{as}(\vec{k"})$are QP energies in "s" and "as" states, respectively. Here we point out that if the QPs acquire energy equal to or greater than asson energy, they get transited from "s" to "as" state reducing the population of "s" state thereby making its observable properties vague. This is evident if the temperature of the system increases above T_a where $(3/2)k_BT_a = \hbar\omega_a$ and then one finds that the energy gap and I^* become vague consistent with experiments. Since the "asson" energy is about 10 meV, T_a is about 77 K.

(1) R. R. Sharma, Phy. Rev. **B 63**, 054506 (2001). (2) R. R. Sharma, Physica **C 439**, 47 (2006).(3) R. R. Sharma, Physica **C 468**, 190 (2008)(4) R. R. Sharma, "Dipolon Theory of Kink Structure ...", in "Superconducting ...", Ed. K. N. Courtlandt, P. 81-100, Nova Sc, Pub., Inc., New York, 2009.(5) R. R. Sharma, http://meetings.aps.org/lnk/BAPS.2016.MAR.D9.15.

Ram R. Sharma
University of Illinois at Chicago

Date submitted: 28 Oct 2016 Electronic form version 1.4