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**Dipolon Theory of Superconducting Regular and Pseudo- Energy Gap Parameters at Finite Temperature and Transition Temperatures  $T_C$  and  $T^*$  in High-Temperature Superconductors** RAM SHARMA, University of Illinois at Chicago, Chicago, IL — First temperature dependent regular and pseudo- energy gap parameters and regular ( $T_C$ ) and pseudo- ( $T^*$ ) transition temperatures have been obtained arising from the same physical origin by developing many-body field-theoretic techniques making use of dipolon propagator and electron Green's function with dressed dipolons as mediators of superconductivity, screened Coulomb repulsion, nonrigid electron energy bands, retardation and damping effects and electron-hole asymmetry, as an extension of our previous zero temperature formalism [1]. The theory contains all essential and important electron correlations. The Migdal vertex correction is found to be small ( $\sim 1\%$ ). Our calculated results of temperature dependent regular and pseudo- energy gap parameters and regular ( $T_C$ ) and pseudo- ( $T^*$ ) transition temperatures for Bi-cuprates agree well with available experimental data. In comparison it is concluded that the models (such as the Hubbard and t-j models) should contain additionally electron correlations due to dipolons to visualize superconductivity.

1. R.R. Sharma, Phys. Rev. **B 63**, 054506, (2001).

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