

HOMES RELATION IN ATTRACTIVE HUBBARD MODEL IN

$$D = \infty$$

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Lack of the recognized theory of high-temperature superconductivity (HTS) has led to an intense experimental and theoretical search for some universal relationships, which might unravel the physics behind HTS. One of the most known is so called Uemura relation, $\rho_s(0) \propto T_c$, where ρ_s is superfluid density and T_c is the superconducting transition temperature. Recently Homes *et al.* (Nature **430**, 539 (2004)) reported a new universal scaling relation, $\rho_s \propto \sigma(T_c) \cdot T_c$, where $\sigma(T)$ is dc conductivity. On the other hand there are also reports, citing data denying the universality of this new relation and ascribing the cases where the relation does appear to some well known mechanisms. In this situation theoretical calculations of the effect would be very interesting. Unfortunately calculating transport properties like $\sigma(T)$ is not a simple task. The present paper shows the results of calculations of the Homes relation for the attractive Hubbard model in the limit of infinite dimensions $d = \infty$, where calculations are simplified but the results can still be an approximation for the $d = 3$ case.

13.4 cm

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9.7 cm