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Calculation of the pairing temperature T_c and the gap function in electron-doped cuprates DHANANJAY DHOKARH, ANDREY CHUBUKOV, UW-Madison, Physics — Using a spin-Fermion model, and applying an Eliashberg-type theory to electron-doped cuprates at quantum criticality, we calculate the pairing transition temperature T_c, and the gap function $\Delta(\vec{k}, \omega_n)$ for $T < T_c$. We carry out the calculation with a frequency dependent interaction, mediated by spin fluctuations exchange. We argue that for near-critical electron-doped cuprates, the geometry of the problem is such that the Fermi surface curvature plays an important role in the calculation of the polarization bubble Π, the fermionic self energy Σ, as well as the anomalous self energy Σ_{02}. For $T < T_c$ the polarization Π also depends on $\Delta(\vec{k}, \omega_n)$. As an advantage over previous works, vertex corrections are also included in our calculations. We show that vertex corrections actually give rise to a larger T_c and explain why. For $T < T_c$, we obtain a gap function $\Delta(\vec{k}, \omega_n)$ that is non-monotonic along the Fermi-surface, but monotonically decreases as a function of frequency ω_n. We find that the ratio of the maximum of Δ to T_c is around 1.8 without vertex corrections; with the corrections it is around 4.

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