Superconducting Density of States from the Magnetic Penetration Depth of Electron-Doped Cuprates 2-xx4-yLaCeCuO and 2-xx4-yPrCeCuO

From measurements of the magnetic penetration depth, \(\lambda(T)\), from 1.6 K to \(T_c\) in films of electron-doped cuprates \(La_{2-x}Ce_xCuO_4-y\) and \(Pr_{2-x}Ce_xCuO_4-y\) we obtain the normalized density of states, \(N_s(E)\) at \(T=0\) by using a simple model. In this framework, the flat behavior of \(\lambda(-2)(T)\) at low \(T\) implies \(N_s(E)\) is small, possibly gapped, at low energies. The upward curvature in \(\lambda(-2)(T)\) near \(T_c\) seen in overdoped films implies that superfluid comes from an anomalously small energy band within about \(3k_B(T_c)\) of the Fermi surface.
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