

LOW TEMPERATURE SUPERFLUID DENSITY  
OF  $d$ -WAVE SUPERCONDUCTOR  
IN AN APPLIED MAGNETIC FIELD

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S u m m a r y

The temperature and field dependences of the superfluid density  $\rho_s$  in the vortex state of a  $d$ -wave superconductor are calculated using a microscopic model in the quasiclassical approximation. We show that, at temperatures below  $T^* \propto \sqrt{H}$ , the linear  $T$  dependence of  $\rho_s$  crosses over to a  $T^2$  dependence differently from the behavior of the effective penetration depth,  $\lambda_{\text{eff}}^{-2}(T)$ . We point out that the expected dependences could be probed by a mutual-inductance technique experiment.