

## **Low-T Decoherence and Relaxation in a Superconducting Charge Qubit**

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We have found an exact expression for the decoherence rate of a Josephson charge qubit coupled to fluctuating background charges. At low temperatures the decoherence rate  $\Gamma$  is linear in  $T$  while at high temperatures it saturates in agreement with a known classical solution which, however, reached at surprisingly high  $T$ . In contrast to the classical picture, impurity states spread in a wide interval of energies ( $\ll T$ ) may essentially contribute to  $\Gamma$ .