



Sonderforschungsbereich 631
Festkörperbasierte Quanteninformationsverarbeitung



Seminar Announcement

Freitag, 5. März 2004

14:00 Uhr c.t.

Seminarraum 450, Theresienstr. 37

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Decoherence of superconducting qubits due to phonons

Decoherence is the main adversary of the unitary time evolution governing the quantum systems which provide the hardware for a future quantum information technology. Solid state implementations of such "quantum hardware" based on superconducting structures have undergone an amazing development during the last years, thus underlying their potential for the construction of quantum information processors. A crucial element in this type of hardware are the Josephson junctions with their dynamics driving the quantum fluctuations in these devices. Here, we discuss a fundamental limitation for the coherent operation of superconducting quantum bits originating from the phonon radiation from Josephson junctions. We find that recently reported quality factors may be explained in terms of decoherence from phonon radiation and show the way to reduce the impact of this dangerous source of decoherence.

gezeichnet: Prof. Jan von Delft, LMU
