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Conductance of d-wave superconductor/normal metal/d-wave superconductor junctions DMYTRO PESIN, ANTON ANDREEV, BORIS SPIVAK, Department of Physics, University of Washington, Seattle, WA 98195, USA — We develop a theory of the low-temperature conductance of superconductor/normal metal/superconductor junctions in which the superconductors have d-wave pairing symmetry. We show that at low temperatures the conductance of the junction is determined by the inelastic relaxation time of quasiparticles in the bulk of d-wave superconductors, $G_{DND} \propto \sqrt{\tau_\epsilon^{(d)}}$. Thus it greatly exceeds the conductance of the normal metal part of the junction, which is controlled by the elastic mean free path. This dependence of G_{DND} on the inelastic relaxation time should be contrasted with that of the low-temperature conductance of the junction in the case of the s- wave superconductor leads, G_{SNS}. In the latter case the conductance is proportional to the first power of the inelastic electron relaxation time in the normal metal part of the junction, $G_{SNS} \propto \tau_\epsilon^{(n)}$ [1].
[1] S. V. Lempitskii, Sov. Phys. JETP **58**, 624 (1983); U. Gunsenheimer and A. D. Zaikin, Phys. Rev. B**50**, 6317 (1994); F. Zhou and B. Spivak, JETP Lett. **65**, 369 (1997).

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