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Electron transport in p-wave superconductor-normal metal junctions[1] AHMET KELES, ANTON ANDREEV, BORIS SPIVAK, University of Washington — We study low temperature electron transport in p-wave superconductor-insulator-normal metal junctions. In diffusive metals the p-wave component of the order parameter decays exponentially at distances larger than the mean free path l. At the superconductor-normal metal boundary, due to spin-orbit interaction, there is a triplet to singlet conversion of the superconducting order parameter. The singlet component survives at distances much larger than l from the boundary. It is this component that controls the low temperature resistance of the junctions. As a result, the resistance of the system strongly depends on the angle between the insulating boundary and the d-vector characterizing the spin structure of the triplet superconducting order parameter. We also analyze the spatial dependence of the electric potential in the presence of the current, and show that the electric field is suppressed in the insulating boundary as well as in the normal metal at distances of order of the coherence length away from the boundary. This is very different from the case of the normal metal-insulator-normal metal junctions, where the voltage drop takes place predominantly at the insulator.

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