

**ANDREEV REFLECTION AFFECTED BY DISORDER AND ELECTRON-
ELECTRON INTERACTIONS**

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We analyze the effect of electron-electron interactions on Andreev current and shot noise in diffusive hybrid structures composed of a normal metal attached to a superconductor via a weakly transmitting interface. We demonstrate that at voltages/temperatures below the Thouless energy of a normal metal Coulomb interaction yields a reduction of both Andreev current and its noise spectrum by a constant factor which essentially depends on the system dimensionality. For quasi-1d structures this factor scales with the number of conducting channels to the power $8/g$, where g defines a dimensionless conductance of a normal metal. At voltages above the Thouless energy the interaction correction to Andreev current and shot noise acquires an additional voltage dependence which turns out to be a power-law in the quasi-1d limit.