

Elementary Charge Transfer Processes in a Superconductor-Ferromagnet Multi-Terminal Structure

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We study transport in a solid state entangler, where Cooper pairs from a superconductor flow into ferromagnetic leads. The obtained statistics of elementary charge transfer can be interpreted as a two-step process to first transfer the Cooper pairs out of the superconductor by Andreev reflection, and subsequently distributing the entangled quasiparticles among the ferromagnetic leads. The probabilities determine how entangled electrons flow into spatially separated leads, are completely determined by experimentally measurable conductances and polarizations. We finally investigate currents, noises and cross correlations, and show how these are affected by transport of entangled electrons.