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【166】 Negative Spin Current Correlation in a Cooper Pair Splitter

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A longstanding goal is to utilize the spin of an electron in electronic devices, both, in applications summarized as spintronics, as well as in fundamental research, for example to demonstrate spin correlations in superconducting electronic elements. To this end, we have introduced ferromagnetic split-gates (FSGs) that allow to individually polarize the electron spin states of semiconductor quantum dots (QDs). Such spin polarized QDs can be used as highly-efficient tunable spin-filters (spin detectors) in complex nanoelectronic devices. Here, we demonstrate a negative spin-correlation in a Cooper pair splitting (CPS) device using two FSG/QD elements at the two output arms which can be tuned in a parallel and antiparallel spin-filter configuration.

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