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Andreev-Fano Effect in a Hybrid Normal-Metal/Superconductor Interferometer

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Abstract: We report on a new type of Fano effect, named as Andreev-Fano effect, in a hybrid normal-metal/superconductor (N/S) interferometer embedded with a quantum dot. Compared with the conventional Fano effect, Andreev-Fano effect has some new features related to the characteristics of Andreev reflection. In the linear response regime, the line shape is the square of the conventional Fano shape, while in the nonlinear transport, a sharp resonant structure is superposed on an expanded interference pattern, which is qualitatively different from the conventional Fano effect. The phase dependence of the hybrid N/S interferometer is also distinguished from those of all-N or all-S interferometers.

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