

Transport of Electron Pairs in a Superconducting Junction Device: Underdamped Case

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Abstract: Transport of electron pairs in a superconducting junction device in the underdamped case is investigated. It is shown that the capacitance of the junctions can slow the movement of the electron pairs and reduce the net voltage. It is also shown that, for the underdamped case and the overdamped case, the movement of the electron pairs in this superconducting junctions device has some similar features. By controlling the correlation between the additive and multiplicative noise, the flux can be reversed. In addition, if the additive noise strength (or the temperature  $T$ ) is large enough, a reversal can also be induced.

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Key words: superconducting junction, electron pairs, noise

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