

Persistent Currents in the Double Aharonov-Bohm Ring Connected to Electron Reservoirs

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Abstract: We study persistent currents in the double Aharonov-Bohm ring connected to two electron reservoirs by quantum waveguide theory. It is found that the persistent currents in the double Aharonov-Bohm ring depend on the direction of the current flow from one reservoir to another. When the direction of the current flow reverses, the persistent current in each ring of the double Aharonov-Bohm ring changes. If the two rings are of the same size, the persistent currents in the left and the right rings exchange at the reversal of the current flow direction.

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Key words: quantum waveguide theory, mesoscopic structure, persistent currents

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