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Electron pair tunneling resonance in a double-dot interferometry

JINHONG PARK, H.-S. SIM, KAIST — It is difficult to experimentally detect an electron pair tunneling resonance in a quantum dot with repulsive Coulomb interactions, since it is usually masked by lower-order single-electron tunneling processes. We propose to use an Aharonov-Bohm interferometry consisting of two quantum dots for the detection. We find that in the second harmonics of the interference current, pair tunneling processes give a leading non-monotonous contribution around the bias voltages at which pair tunneling resonances appear. The second-harmonics differential conductance shows the signal of a pair tunneling resonance as well as the destructive interference of two pair tunneling resonances.

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