

Asymmetric Double Quantum Dots as a Subminiature Mesoscopic Cell

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Abstract: A subminiature mesoscopic cell, consisting of asymmetric double quantum dots capacitively coupled to a nearby mesoscopic circuit, is proposed, which can transform disordered noise energy to ordered electric energy. Two schemes, the noises originating from the nearby mesoscopic circuit and from the electromagnetic wave disturbance in external environment, are investigated. We found that the proposed cell can manifest as a good constant current source and the output current may not reach its largest value even if the circuit is shorted.

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