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Electrochemical capacitance and charge relaxation resistance of mesoscopic capacitors FUMING XU, JIAN WANG, Department of Physics and the Center of Theoretical and Computational Physics, The University of Hong Kong, Hong Kong, China — We investigate numerically the transport properties of a mesoscopic capacitor which consists of a quantum dot connected via a single lead to an electron reservoir. The fluctuations and distributions of electrochemical capacitance C_μ and charge relaxation resistance R_q have been studied. It shows that the distribution of electrochemical capacitance C_μ at one conducting channel case in our numerical calculation is different from the former theoretical prediction obtained from the scattering matrix theory. The difference is due to the existence of necklace states which has been observed in a recent optical experiment.

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