

Abstract Submitted
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AC-conductance of a quantum chaotic cavity (semiclassical approach)¹ C. PETITJEAN, D. WALTNER, J. KUIPERS, I. ADAGIDELI, K.R. RICHTER — Due to the progress made in the control and the manipulation of mesoscopic structures driven by high frequency periodic voltages, the ac regime has been recently experimentally investigated [1] and consequently its theoretical interest has been renewed. We consider here, a quantum chaotic cavity that is coupled via tunnel barriers and gates to a macroscopic circuit which contains ac-sources [2]. By extending to the ac-transport, the recent trajectory-based semiclassical theory of quantum chaotic transport in presence of tunnel barrier [3], we derive for arbitrary tunneling rates and arbitrary positive Ehrenfest time, the averaged and the weak-localization correction to the screened conductance. Then we use these results to investigate the effect of dephasing on the relaxation resistance of a chaotic capacitor in the linear low frequency regime. This last investigation are in principle relevant to the recent measure of the admittance at zero magnetic flux of a mesoscopic capacitor [1,4].

References

- [1] J. Gabelli et al., *Science* **313**, 499 (2006).
- [2] C. Petitjean et al, *in preparation* (2008).
- [3] R.S. Whitney, *Phys. Rev. B*, **75**, 235404 (2007).
- [4] S. Nigg and M. Büttiker, *Phys. Rev. B* **77**, 085312 (2008).

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