

Semiclassical theory of chaotic conductors

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Universality of transport properties (conductance, conductance variance, shot noise) of fully chaotic mesoscopic cavities is demonstrated. The proof is based on representation of the transport properties in terms of transition amplitudes associated with the entrance-to-exit classical trajectories. The non-classical contributions are traced to pairs (case of conductance) or quadruplets (conductance variance, shot noise) of trajectories consisting of practically the same pieces traversed in different order and with different sense. The trajectory pieces are separated by "self-encounters", i.e., narrow avoided crossings in phase space of the trajectory with itself or another trajectory. Summation over all relevant trajectory pairs (resp. quadruplets) brings about universal results in agreement with the predictions of Random Matrix Theory.