

Abstract Submitted
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The random phase property and the Lyapunov spectrum for disordered multi-channel systems RUDOLF ROEMER, University of Warwick, HERMANN SCHULZ-BALDES, Universitaet Erlangen — A random phase property establishing a link between quasi-one-dimensional random Schroedinger operators and full random matrix theory is advocated. Briefly summarized it states that the random transfer matrices placed into a normal system of coordinates act on the isotropic frames and lead to a Markov process with a unique invariant measure which is of geometric nature. On the elliptic part of the transfer matrices, this measure is invariant under the full hermitian symplectic group of the universality class under study. While the random phase property can up to now only be proved in special models or in a restricted sense, we provide strong numerical evidence that it holds in the Anderson model of localization. A main outcome of the random phase property is a perturbative calculation of the Lyapunov exponents which shows that the Lyapunov spectrum is equidistant and that the localization lengths for large systems in the unitary, orthogonal and symplectic ensemble differ by a factor 2 each. In an Anderson-Ando model on a tubular geometry with magnetic field and spin-orbit coupling, the normal system of coordinates is calculated and this is used to derive explicit energy dependent formulas for the Lyapunov spectrum.

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