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Robustness of quantum multifractality BERTRAND GEORGEOT, RÉMY DUBERTRAND, LPT IRSAMC CNRS/Univ. Paul Sabatier Toulouse France, IGNACIO GARCIA-MATA, CONICETUNMdP Mar del Plata, Argentina, OLIVIER GIRAUD, LPTMS, CNRS/Univ. Paris-Sud Orsay France, GABRIEL LEMARIÉ, LPT IRSAMC CNRS/Univ. Paul Sabatier Toulouse France, JOHN MARTIN, IPNAS Université de Liège, Liège Belgium — Several models where quantum wave functions display multifractal properties have been recently identified. In the quantum chaos field, they correspond to pseudointegrable systems, with properties intermediate between integrability and chaos. In condensed matter, they include electrons in a disordered potential at the Anderson metal-insulator transition. These multifractality properties lead to particular transport properties and appear in conjunction with specific types of spectral statistics. In parallel, progress in experimental techniques allow to observe finer and finer properties of the wavefunctions of quantum or wave systems, as well as to perform experiments with unprecedented control on the dynamics of the systems studied. In this context, this talk will discuss the robustness of multifractality in presence of small perturbations. We identify two distinct processes of multifractality destruction according to the type of perturbation, and specify a range of parameters where multifractality could indeed be observed in physical systems in presence of imperfections.

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