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UNIVERSITÄT
HEIDELBERG
ZUKUNFT
SEIT 1386

STRUCTURES JOUR FIXE

WOJCIECH DE ROECK

KU Leuven, Belgium

"Stability and instability of Many-Body Localization"

6 Dezember 2019 11:30 AM

Room 106, Philosophenweg 12
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ABSTRACT

I will discuss the current state of knowledge on many-body localization (MBL).

For the sake of this talk, MBL could be defined as a robust absence of transport in many-body systems at thermodynamic parameters corresponding to non-zero entropy density, ie. for example, excluding systems near the ground state. An important issue is the stability of the MBL phase against Griffiths effects. We have put forward a theory that predicts instability (hence: non-existence) of the MBL phase whenever the spatial dimension is higher than 1 or the model contains interactions or hoppings that decay slower than exponential with a universal decay length. In particular, this excludes MBL in models with long-range interactions. This theory is tested numerically in some controlled toy models.

Time permitting I will also discuss some rigorous results showing sub-diffusive bounds on transport, even on the delocalised side of the localisation-delocalisation transition.

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