Multifractal finite-size scaling at the Anderson transition in the unitary symmetry class

Jakob Lindinger

In this talk we present the results and the procedure of a thorough analysis of the Anderson transition by means of *multifractal finite-size scaling* conducted in the framework of a bachelor thesis. We extend the results for the orthogonal symmetry class by Rodriguez and co-workers [*Phys. Rev. B* **84** (2011), 134209] to the unitary symmetry class and estimate the critical parameters as well as the multifractal exponents with high precision using wave function data of systems up to $L^3 = 120^3$. At first we will explain the underlying physical concepts (e.g. *multifractality* and the scaling theory of localisation). Then, in order to get a deeper insight into critical phenomena in general and the Anderson transition in particular, the examination of the scaling of the probability density function of wave function intensities and a single-variable scaling method to investigate the Anderson transition will be discussed. This helps us perform the multifractal finite-size scaling analysis, yielding the critical disorder $W_c = 18.102(18.097, 18.106)$ and the critical exponent $\nu = 1.460(1.452, 1.468)$, where the intervals in parentheses are 95% confidence intervals.