

Abstract Submitted
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Multifractal analysis with the probability density function at the three-dimensional Anderson transition LOUELLA VASQUEZ, ALBERTO RODRIGUEZ, RUDOLF ROEMER, Department of Physics and Centre for Scientific Computing, University of Warwick, Coventry, CV 7AL, United Kingdom — The probability density function (PDF) for critical wavefunction amplitudes is studied in the three-dimensional Anderson model. We present a formal expression between the PDF and the multifractal spectrum $f(\alpha)$ in which the role of finite-size corrections is properly analyzed. We show the non-gaussian nature and the existence of a symmetry relation in the PDF. From the PDF, we extract information about $f(\alpha)$ at criticality such as the presence of negative fractal dimensions and the possible existence of termination points. A PDF-based multifractal analysis is shown to be a valid alternative to the standard approach based on the scaling of inverse participation ratios.

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