

Abstract Submitted
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Localization Transition of the Three-Dimensional Lorentz Model and Continuum Percolation FELIX HOEFLING, THOMAS FRANOSCH, ERWIN FREY, Ludwig-Maximilians-Universitaet Muenchen — The localization transition and the critical properties of the Lorentz model in three dimensions are investigated by computer simulations. We give a coherent and quantitative explanation of the dynamics in terms of continuum percolation theory, an excellent matching of both the critical density and exponents is obtained. Upon exploiting a dynamic scaling Ansatz employing two divergent length scales we find data collapse for the mean-square displacements and identify the leading-order corrections to scaling. Our data corroborate a hyperscaling relation that connects dynamic and geometric critical exponents. The non-Gaussian parameter is predicted to diverge at the transition. [F. Hoefling, T. Franosch, and E. Frey, Phys. Rev. Lett. 96, 165901 (2006)]

Erwin Frey
Ludwig-Maximilians-Universitaet Muenchen

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