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Critical parameters for the disorder-induced metal-insulator transition in FCC and BCC lattices ANDRZEJ EILMES, Department of Computational Methods in Chemistry, Jagiellonian University, Krakow, Poland, ANDREA M. FISCHER, RUDOLF A. ROEMER, Department of Physics and Centre for Scientific Computing, University of Warwick, UK — We use a transfer matrix method to study the disorder-induced metal-insulator transition for. We take isotropic nearest- neighbour hopping and an onsite potential with uniformly distributed disorder. Following previous work done on the simple cubic lattice, we perform numerical calculations for the face centred cubic (FCC) and body centred cubic (BCC) lattices, which are more common in nature. We obtain the localisation length from calculated Lyapunov exponents for different system sizes. This data is analysed using finite size scaling to find the critical parameters. We create an energy-disorder phase diagram for both lattice types, noting that it is symmetric about the band centre for the BCC lattice, but not for the FCC lattice. We find a critical exponent of approximately 1.5-1.6 for both lattice types for transitions occurring either at fixed energy or at fixed disorder, agreeing with results previously obtained for other systems belonging to the same orthogonal universality class. We notice an increase in critical disorder with the number of nearest neighbours, which agrees with intuition.

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