

Numerical solution of the eigenvalue problem for the Anderson Model

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Abstract

We discuss the application of modern eigenvalue algorithms to an eigenvalue problem arising in quantum physics, namely, the computation of a few interior eigenvalues and their associated eigenvectors for the large, sparse, real, symmetric, and indefinite matrices of the Anderson model of localization. This seemingly innocuous problem presents a major challenge for all modern eigenvalue algorithms. We show why this is the case and also discuss some remedies although so far none of these has turned out to be really successful.