Spectral Theory of Anderson Type Hamiltonians

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Abstract

The talk would review joint work of V. Jaksic and the speaker from the last few years, concerning spectral theory of general Anderson Type Hamiltonians. These are self adjoint operators made of two terms. One is some fixed self adjoint operator and the other is a random sum of rank-one operators. Among the main results to be discussed is a general decomposition theorem saying that such an operator induces a decomposition of the Hilbert space into components that effectively "do not see each other" as the random part of the operator is varied. Additional results include the almost sure simplicity of singular spectrum and the tendency of absolutely continuous spectrum associated with cases where there is only one component in the Hilbert space to be pure.