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The scaling limit of the critical one-dimensional random Schrodinger operator

We study the one dimensional discrete random Schrodinger operator

$$(H_n\psi)_\ell = \psi_{\ell-1} + \psi_{\ell+1} + v_\ell\psi_\ell,$$

$\psi_0 = \psi_{n+1} = 0$, in the scaling limit $\mathrm{Var}(v_\ell) = \sigma^2/n$. We show that, in the bulk of spectrum, the eigenfunctions are delocalized and that there is a very strong repulsion of eigenvalues. The analysis is based on a stochastic differential equation for the evolution of products of transfer matrices. This talk is based on a joint work with Benedek Valko and Balint Virag.