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Exact solution to the random matrix problems from the symmetries of integrable systems ALEX VAGOV, Univ Bayreuth, D-95440 Bayreuth, Germany, OLEG VOROV, UNC at Charlotte — The problem with random non-Hermitian Hamiltonian (the Hatano-Nelson problem) arises in context of theory of depinning of the flux lines from extended defects in type II superconductors subject to a tilted external magnetic field. It is also of great interest in the context of random matrix theories. We employ a novel method, based on the inverse scattering/spectral transform, to obtain an exact analytic solution to the matrix version of the Hatano-Nelson problem. The idea is to use the exact connection between the linear (spectral or scattering problem) and exactly integrable nonlinear systems. This allows us to evaluate exactly the average over the ensemble of random Hamiltonians and to calculate the complex eigenvalue distributions for the random non-Hermitian matrices, the localization length, Lyapunov exponents. Applications of the method to other quantum and classical systems with random Hamiltonians both discrete and continuous, are discussed.

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