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Spontaneous Breaking of $U(N)$ symmetry in invariant Matrix Models[1] FABIO FRANCHINI, SISSA/M.I.T. — Matrix Models have a strong history of success in describing a variety of situations, from nuclei spectra to conduction in mesoscopic systems, from strongly interacting systems to various aspects of mathematical physics. Traditionally, the requirement of base invariance has lead to a factorization of the eigenvalue and eigenvector distribution and, in turn, to the conclusion that invariant models describe extended systems. I will show that deviations of the eigenvalue statistics from the Wigner-Dyson universality induce an effect on the eigenvectors and that the phase transition observed when the eigenvalue density become disconnected correspond to a breaking of the $U(N)$ symmetry to a smaller one. This spontaneous symmetry breaking is essentially a Higgs mechanism, due to the strongly correlated nature of matrix models and opens the possibility to a variety of applications.

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