

SCHWINGER–DYSON EQUATIONS: CLASSICAL AND QUANTUM

James A. Mingo
Roland Speicher

Abstract: In this note we want to have another look on Schwinger–Dyson equations for the eigenvalue distributions and the fluctuations of classical unitarily invariant random matrix models. We are exclusively dealing with one-matrix models, for which the situation is quite well understood. Our point is not to add any new results to this, but to have a more algebraic point of view on these results and to understand from this perspective the universality results for fluctuations of these random matrices. We will also consider corresponding non-commutative or “quantum” random matrix models and contrast the results for fluctuations and Schwinger–Dyson equations in the quantum case with the findings from the classical case.

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