

Structured random matrices and cyclic cumulants : a free probability approach (inspired by noisy many-body quantum systems)

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We shall discuss a new class of large structured random matrices characterised by the properties of their cyclic cumulants. This class is remarkably stable under non-linear operations. We shall present a simple algorithm, based on an extremization problem, to compute the spectrum of sub-blocks of such matrices, and explain the connection between such algorithm and operator valued free probability. This class of random matrices emerged via the study of the quantum symmetric simple exclusion process or, more generally, noisy many-body quantum systems.

[Work done in collaboration with Ludwig Hruza].

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