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Random stochastic matrices from classical compact Lie groups and symmetric spaces. (English) [Zbl 07177380](#)

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Summary: We consider random stochastic matrices M with elements given by $M_{ij} = |U_{ij}|^2$, with U being uniformly distributed on one of the classical compact Lie groups or some of the associated symmetric spaces. We observe numerically that, for large dimensions, the spectral statistics of M , discarding the Perron-Frobenius eigenvalue 1, are similar to those of the Gaussian orthogonal ensemble for symmetric matrices and to those of the real Ginibre ensemble for nonsymmetric matrices. We compute some spectral statistics using Weingarten functions and establish connections with some difficult enumerative problems involving permutations.

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MSC:

- 15B52 Random matrices (algebraic aspects)
- 15B51 Stochastic matrices
- 15B30 Matrix Lie algebras
- 22C05 Compact groups
- 32M15 Hermitian symmetric spaces, bounded symmetric domains, Jordan algebras (complex-analytic aspects)
- 60B20 Random matrices (probabilistic aspects)
- 62M15 Inference from stochastic processes and spectral analysis

Keywords:

[random stochastic matrices](#); [symmetric spaces](#); [Perron-Frobenius eigenvalue](#); [Ginibre ensemble](#)

Full Text: [DOI](#)

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