

# GAUSSIAN FLUCTUATIONS FOR PRODUCTS OF RANDOM MATRICES

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## ABSTRACT

This talk concerns singular values of  $M$ -fold products of i.i.d. right-unitarily invariant  $N \times N$  random matrix ensembles. As  $N$  tends to infinity, the height function of the Lyapunov exponents converges to a deterministic limit for both  $M$  fixed and tending to infinity with  $N$ . In this talk, I will show for a variety of ensembles that fluctuations of these height functions about their mean converge to explicit Gaussian fields which are log-correlated for  $M$  fixed and have a white noise component for  $M$  tending to infinity with  $N$ . These ensembles include rectangular Ginibre matrices, truncated Haar-random unitary matrices, and right-unitarily invariant matrices with fixed singular values. I will sketch our technique, which derives a central limit theorem for global fluctuations via certain conditions on the multivariate Bessel generating function, a Laplace-transform-like object associated to the spectral measures of these matrix products.

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