

# Eigenvalue distributions of high-dimensional matrix processes driven by fractional Brownian motion

## Abstract

In this article, we study a class of symmetric or Hermitian random matrices, whose entries are generated from the solution  $X_t$  of stochastic differential equation driven by fractional Brownian motion with Hurst parameter  $H \in (1/2, 1)$ . Three types of matrices are considered: (1) Wigner-type matrices; (2) matrices with entries being local sums of i.i.d. copies of  $X_t$ ; (3) Wishart-type matrices. When the dimension of the matrix-valued processes grows to infinity, we characterize the limit of the empirical measure-valued processes of their eigenvalues. As a byproduct, we obtain a general tightness criterion for probability measures on the space  $C([0, T], \mathbf{P}(\mathbb{R}))$  of continuous measure-valued processes.

This is a joint work with Jianfeng Yao and Wangjun Yuan.