CONVERGENCE OF THE EMPIRICAL SPECTRAL DISTRIBUTION OF GAUSSIAN MATRIX-VALUED PROCESSES

For a given normalized Gaussian symmetric matrix-valued process $Y^{(n)} = (Y^{(n)}(t); t \geq 0)$, we consider the process of its eigenvalues $((\lambda_1^{(n)}(t), \ldots, \lambda_n^{(n)}(t)); t \geq 0)$, and prove that, under some mild conditions on the covariance function associated to $Y^{(n)}$, the empirical spectral distribution converges in probability to a deterministic limit $(\mu_t, t \geq 0)$, in the topology of weak convergence of probability measures; which is characterized by its Cauchy transform in terms of the solution of a Burgers' equation. Our results extend those of Pardo et al. for the non-commutative fractional Brownian motion when $H > 1/2$, Rogers and Shi for the free Brownian motion $H = 1/2$.