RANDOM MATRICES BY MA MODELS AND COMPOUND FREE POISSON LAWS

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Abstract: Recently, Pfaffel and Schlemm have investigated the Mar-chenko–Pastur type limit ($n \to \infty$ and $\lim_{n\to\infty} n/p = \lambda > 0$) of the sample covariance matrix $p^{-1} X_n{}^t X_n$, where X_n is the $p \times n$ random matrix with dependence such that each row of X_n is given by a certain linear process. They have also determined the limit spectral measure by giving the functional equation for its Stieltjes transform.

In this paper, we will see that such a limit spectral measure is a compound free Poisson law and, in the case where dependence is given by MA modeled Gaussian process, the sample covariance matrix can be regarded as compound Wishart matrix and, hence, gives the random matrix model for a compound free Poisson law. We will also give an application of compound Wishart matrix to the statistical data analysis of times series.

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