

This paper considers a continuous time analogue of the classical autoregressive moving average processes, Lévy-driven CARMA processes. First we describe limiting properties of the periodogram by means of the so-called truncated Fourier transform if observations are available continuously. The obtained results are in accordance with their counterparts from the discrete-time case. Then we discuss the numerical approximation of the truncated Fourier transform based on non-equidistant high frequency data. In order to ensure convergence of the numerical approximation to the true value of the truncated Fourier transform a certain control on the maximal distance between observations and the number of observations is needed. We obtain both convergence to the continuous time quantity and asymptotic normality under a high-frequency infinite time horizon limit.