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Infinite server queues with shot noise modulated Poisson arrivals

Based on joint work with Onno Boxma and Michel Mandjes

We consider an infinite-server queue (as well as a network of such) where the input process is a Cox process of the following form. The arrival rate is a vector valued linear transform of a multivariate generalized (i.e., being driven by a subordinator rather than a compound Poisson process) shot-noise process. We first derive some distributional properties of the multivariate generalized shot-noise process. Then these are exploited to obtain the joint transform of the numbers of customers, at various time epochs, in a single infinite-server queue fed by the above mentioned Cox process. We also obtain steady-state transforms pertaining to the joint stationary arrival rate and queue length processes (thus facilitating the analysis of the corresponding departure process), as well as their means and covariance structure. Finally, we extend to the setting of a network of infinite-server queues.