**Extended Inverse Hawkes Processes with General Exciting Functions: Asymptotic Behaviour**

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**Abstract**

Often in several fields of real world applications future developments are functions of past events. Hence, the processes describing these situations cannot be Markovian. But a Hawkes process has an intensity that is stochastic and depends on the past history of the process itself, while an inverse Hawkes process is a process that has constant intensity and stochastic jump size, depending on its past history. That is why, this paper considers processes that are obtained by combining Hawkes processes and inverse Hawkes processes. In this context the asymptotic results studied are generalized versions of the Law of Large Numbers and of the Central Limit Theorem.