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Two-step estimation procedures for inhomogeneous shot-noise Cox processes

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Abstract In the present paper, we discuss and compare several two-step estimation procedures for inhomogeneous shot-noise Cox processes. The intensity function is parametrized by the inhomogeneity parameters while the pair-correlation function is parametrized by the interaction parameters. The suggested procedures are based on a combination of Poisson likelihood estimation of the inhomogeneity parameters in the first step and an adaptation of a method from the homogeneous case for estimation of the interaction parameters in the second step. The adapted methods, based on minimum contrast estimation, composite likelihood and Palm likelihood, are compared both theoretically and by means of a simulation study. The general conclusion from the simulation study is that the three estimation methods have similar performance. Two-step estimation with Palm likelihood has not been considered before and is motivated by the superior performance of the Palm likelihood in the stationary case for estimation of certain parameters of interest. Asymptotic normality of the two-step estimator with Palm likelihood is proved.

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