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Estimation variances for parameterized marked Poisson processes and for parameterized Poisson segment processes

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Abstract: A complete and sufficient statistic is found for stationary marked Poisson processes with a parametric distribution of marks. Then this statistic is used to derive the uniformly best unbiased estimator for the length density of a Poisson or Cox segment process with a parametric primary grain distribution. It is the number of segments with reference point within the sampling window divided by the window volume and multiplied by the uniformly best unbiased estimator of the mean segment length.

Keywords: complete statistic, compact sets process, intensity estimation, marked point process, Poisson process, random closed sets, Rao-Blackwell Theorem, segment process, spatial statistic, stochastic geometry, sufficient statistic

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