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# Poisson source localization on the plane: change-point case

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## Abstract
We present a detection problem where several spatially distributed sensors observe
Poisson signals emitted from a single radioactive source of unknown position. The
measurements at each sensor are modeled by independent inhomogeneous Poisson
processes. A method based on Bayesian change-point estimation is proposed to iden-
tify the location of the source's coordinates. The asymptotic behavior of the Bayesian
estimator is studied. In particular, the consistency and the asymptotic efficiency of the
estimator are analyzed. The limit distribution and the convergence of the moments
are also described. The similar statistical model could be used in GPS localization
problems.

**Keywords** Inhomogeneous Poisson process · Change-point problem · Bayesian
estimator · Likelihood ratio process · Radioactive source · Sensors · GPS localization

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