

Objective Bayesian analysis for CAR models

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Abstract Objective priors, especially reference priors, have been studied extensively for spatial data in the last decade. In this paper, we study objective priors for a CAR model. In particular, the properties of the reference prior and the corresponding posterior are studied. Furthermore, we show that the frequentist coverage probabilities of posterior credible intervals depend only on the spatial dependence parameter ρ , and not on the regression coefficient or the error variance. Based on the simulation study for comparing the reference and Jeffreys priors, the performance of two reference priors is similar and better than the Jeffreys priors. One spatial dataset is used for illustration.

Keywords Conditional autoregressive · Jeffreys prior · Reference prior · Integrated likelihood · Propriety of posterior