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Nonlinear Poisson autoregression

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Abstract We study statistical properties of a class of non-linear models for regression analysis of count time series. Under mild conditions, it is shown that a perturbed version of the model is geometrically ergodic and possesses moments of any order. This result turns out to be instrumental on deriving large sample properties of the maximum likelihood estimators of the regression parameters. The theory is illustrated with examples.

Keywords Geometric ergodicity · Link function · Maximum likelihood estimation · Perturbation · Smooth transition models