Threshold negative binomial autoregressive model

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Abstract: This article studies an observation-driven model for time series of counts, which allows for overdispersion and negative serial dependence in the observations. The observations are supposed to follow a negative binomial distribution conditioned on past information with the form of thresh old models, which generates a two-regime structure on the basis of the magnitude of the lagged observations. We use the weak dependence approach to establish the stationarity and ergodicity, and the inference for regression parameters are obtained by the quasi-likelihood. Moreover, asymptotic properties of both quasi-maximum likelihood estimators and the threshold estimator are established, respectively. Simulation studies are considered and so are two applications, one of which is the trading volume of a stock and another is the number of major earthquakes.