

State-Based Models for Light Curve Classification

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Abstract

I discuss here the application of continuous time autoregressive models to the characterization of astrophysical variability. These types of models are general enough to represent many classes of variability, and descriptive enough to provide features for lightcurve classification. Importantly, the features of these models may be interpreted in terms of the power spectrum of the lightcurve, enabling constraints on characteristic timescales and periodicity. These models may be extended to include vector-valued inputs, raising the prospect of a fully general modeling and classification environment that uses multi-passband inputs to create a single phenomenological model. These types of spectral-temporal models are an important extension of extant techniques, and necessary in the upcoming eras of Gaia and LSST.