Estimating the Number and Location of Structural Breaks in Astrophysical Source Populations

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In this work we apply semi-parametric techniques to the joint spectral-temporal modeling of high-energy astronomical data. This includes the automatic detection of emission lines and structural breaks in the temporal direction. We apply L1 penalties to regularize the model fitting. The "dimension" of the best-fitting model is chosen by a new form of the minimum description length principle that is designed for the "large p small n" scenario.

This is joint work with Vinay Kashyap, David van Dyk and Raymond K. W. Wong.

Key Words: L1 penalty, minimum description length principle, Poisson data modeling, regularization