

## ***Bayesian-Turchin Approach to XAS Analysis***

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We discuss a method to analyze x-ray absorption spectra (XAS). The method is based on the Bayesian-Turchin approach, which avoids the arbitrary restriction on the size of the model parameter space. The method makes use of an *a priori* guess of the model parameters and their uncertainties, which are introduced into the fitting by Bayesian arguments. This leads to a set of linear equations for the model parameters, which is regularized using the Turchin condition. The approach naturally partitions parameter space into relevant and irrelevant sub-spaces, which are determined by the experimental data or the *a priori* information respectively. The method is applied to fit the full XAS signal including both x-ray absorption fine structure (XAFS)  $\chi$  and the background absorption  $\mu_0$  with model parameters including distances, coordination numbers and spring constants. Prospects for XANES analysis are briefly discussed.