# HIERARCHICAL BAYESIAN DATA SELECTION

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One common approach to reduced-order modelling is to fit a simplified model to data generated by a more complex, full model. However, the full model may produce data that are inconsistent with the reduced model, potentially leading to biased parameter inference and reduced model accuracy in regions where the reduced model is working well. To address this issue, we propose a hierarchical Bayesian data selection framework, in which indicators of data consistency are inferred jointly with the model parameters. This approach enables the identification of regions in the observation space where the reduced model is valid, as well as those where it fails. Such insights can be used for model validation or to highlight features of the data that the reduced model cannot capture. We illustrate the method with some simple linear regression examples, followed by two examples of application of the methods to problems in biology.