Resolution-matrix-constrained model updates for bayesian seismic tomography

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One of the most important issues of interpreting seismic tomography models is the need to provide a quantification of their uncertainty. Bayesian approach to inverse problems offers a rigorous way to quantitatively estimate this uncertainty at the price of an higher computation time. Optimizing bayesian algorithms is therefore a key problem. We are developing a multivariate model-updating scheme that makes use of the constraints provided by the Model Resolution Matrix , aiming to a more efficient sampling of the model space. The Resolution Matrix relates the true model to the estimate, its off-diagonal values provide a set of trade-off relations between model parameters used in our algorithm to obtain optimized model updates.