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Markov chain Monte Carlo Methods for Seismic Inversion

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Bayesian seismic inversion can be used to sample from the posterior distribution of the velocity field, thus allowing for uncertainty quantification. However, traditional Markov chain Monte Carlo (McMC) can be extremely computationally expensive. In this presentation we compare recently proposed, computationally effective McMC methods, such as a two-stage [1,2], a Hamiltonian procedure [3], and the DREAM [4], in examples where we consider both the modeling of the velocity field within geological layers as well as the identification of boundaries between such layers.

References

[1] Stuart, G. K., W. Yang, S. Minkoff, and F. Pereira, 2016, A two-stage Markov chain Monte Carlo method for velocity estimation and uncertainty quantification, in SEG Technical Program Expanded Abstracts 2016: SEG, 3682–3687.
[2] Stuart, G. K., W. Yang, S. Minkoff, and F. Pereira, 2017, A Two-Stage Markov Chain Monte Carlo Method for Seismic Inversion (submitted).
[3] R. Neal, MCMC using Hamiltonian dynamics, 2011, Chapter 5 of the Handbook of Markov Chain Monte Carlo Edited by S. Brooks, A. Gelman, G. Jones, and X. Meng Chapman & Hall – CRC Press, 2011.
[4] J. Vrugt, 2016, Markov chain Monte Carlo simulation using the DREAM software package: Theory, concepts, and MATLAB implementation, Environmental Modelling & Software 75, 273-316.

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