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Mami T Wentworth* (mtonoe@ncsu.edu), North Carolina State University, Department of Mathematics, Campus Box 8201, Raleigh, NC 27695, and **Ralph C Smith** (rsmith@ncsu.edu).
Verification techniques for Bayesian model calibration. Preliminary report.

We discuss techniques to verify the accuracy of parameter or input densities constructed using Bayesian inference. The posterior distribution can be computed using the prior distribution, likelihood and possibly high-dimensional integration. We first employ a direct method to compute the posterior using the formula directly via a numerical quadrature. We then compare the direct method to two adaptive methods, Delayed Rejection Adaptive Metropolis (DRAM) and Differential Evolution Adaptive Metropolis (DREAM). These methods employ a MCMC algorithm and efficiently estimate model parameters without involving high-dimensional integration. We use a steady-state heat model as an example to demonstrate how these methods construct densities and compare their accuracy. (Received September 14, 2013)