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Challenges for prior selection in sloppy, multiparameter models¹ YONATAN KURNIAWAN, CODY PETRIE, MARK TRANSTRUM, KINAMO WILLIAMS, Brigham Young University — Uncertainty quantification is an important tool for assessing the credibility of a model. However, multi-parameter models from many fields are often insensitive to large, coordinated changes in many of their parameter combinations, a phenomenon known as sloppiness. Often, confidence regions in a model's parameter space do not close and the range of physically allowed parameter values is effectively infinite. In Markov Chain Monte Carlo (MCMC) sampling of a Bayesian posterior, sloppiness leads to a phenomenon known as parameter evaporation, in which the samples prefer the sub-optimal region at some sampling temperature. I demonstrate this phenomenon on several illustrative examples and discuss how the choice of prior in the Bayesian posterior can bias sampling results in subtle, unexpected ways.

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