

# **Data assimilation: using Indistinguishable States to solve Berliner's problem of chaotic likelihoods**

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Berliner (1991) points out a number of difficulties in applying the Bayesian paradigm to state estimation in chaotic systems. Even in the perfect model scenario, likelihood methods have difficulty in providing good estimate of the initial condition (or the model parameters). In large part, the difficulty lies in the failure to skillfully meld information in the dynamics of the non-linear system itself with that from the observations. A new approach using indistinguishable states (Judd and Smith, 2001) is