On the discretization of the Onsager-Machlup functional

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When taking the model error into account, one needs to evaluate the prior distribution (the Onsager-Machlup functional), which contains the divergence term difficult to be calculated for large systems. However, the Euler method for time discretization of the functional can eliminate the need for evaluating the divergence term. This property is of use for solving nonlinear data assimilation problems with sampling methods such as the Metropolis-adjusted Langevin algorithm.

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