

Parameter Optimization in Climate Models Using Fixed Point Iterations

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Many climate models compute steady states via a fixed point or pseudo time-stepping algorithm. In order to optimize model parameters, it is important that these steady states can be computed efficiently. Moreover the optimization algorithm should avoid extensive recomputing or storing of model trajectories, as it is the case in the classical adjoint technique. We present a so-called one-shot method that can be used to replace the standard sequence of forward integration (for the state) and backward integration (for the adjoint) by a coupled integration. We present examples with models used in climate research for ocean circulation and biogeochemistry in the ocean.