



Mathematisches Kolloquium

Data Assimilation and conservation laws

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Abstract:

The initial state for a geophysical numerical model is produced by combining available observational data with a short range model simulation using a data assimilation algorithm. A deterministic model then produces from this initial state predictions of the future. It has been shown in many applications that nonlinear dynamical systems are very sensitive to the proper specification of initial conditions, and that predictions into the future can significantly differ, even if the differences in the initial conditions are small. The main goal of data assimilation is to produce the best analysis (best initial condition) for the numerical model; that is, the estimate that gives the best prediction for the time scales and geophysical phenomena that we are focusing on.

In this talk, we present the mechanisms of data assimilation algorithms on examples that range from toy models to atmospheric and oceanic applications. We focus on the ensemble Kalman filter algorithm and the inclusion of constraints in order to obtain physically feasible solutions that are consistent with both, the nature and the prediction model. We show that data assimilation algorithms can and should incorporate some of the conservation principles that are often considered in the development of numerical discretization schemes.

Dienstag, 21. Mai 2019, KG I/Bau A 103, 16.15 Uhr.
Um 16.00 Uhr werden im selben Raum Kaffee und Tee serviert.