
Interim Report

Mathematics of Planet Earth CDT

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In the perturbation analysis of climate models and in general, statistical mechanical models, one has to consider two kinds of sensitivity. First, one has to take into account the dependence of the system on initial conditions often arising from basic assumptions of chaoticity. Secondly, the sensitivity to sudden changes in the parameters of the governing laws are to be studied. This is the problem to be tackled in this project. Based on response theory of statistical mechanical systems we shall make a transfer operator approach in order to extract the dynamical information and formulate a response theory based on this idea.

Literature Review

The starting point of the project was to study the response of dynamical systems governed by finite dimensional Markov operators, this is, stochastic matrices which are defined as

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