Predictability and prediction under uncertainty — Methods from stochastic dynamical systems

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It is recognized that it may be beneficial, as well as indispensable, to include random effects in the mathematical modeling of geophysical and climate systems. This leads to stochastic dynamical models for climate dynamics. Predictability and prediction can be dealt with in this context.

The last two decades have seen important developments in both the areas of stochastic analysis and of nonlinear dynamical systems. Stochastic dynamical systems, as the combination of these two seemly remote mathematical areas, have attracted considerable attention in climate modeling community recently.

We will review available methods and new techniques from stochastic dynamical systems theory, that are useful for understanding stochastic climate dynamics.