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Projection and perturbation

An invariant distribution of a dynamical system is a fixed point of the associated transfer operator. A natural way for the numerical approximation of these objects is to use Galerkin type projection methods. However, there is little known about the convergence of such methods, since in general transfer operators are not compact.

Another interesting property to investigate is the so-called stochastic stability of dynamical systems, i.e. if the invariant distribution changes continuously with the perturbation of the dynamical system.

Considering the projection as a small random perturbation one may hope to be able to show the convergence of numerical methods by using results from stability theory. I will present this idea and show some first results. Also, there are some open questions, which we can discuss afterwards.