Stable Nonlinear Dynamical Approximation with Dynamical Sampling

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Abstract

In this talk, I present a strategy to solve time-dependent PDEs with nonlinear dynamical approximation schemes which are provably stable. The stability, and numerical complexity of the approach rely on the ability to evaluate the numerical solution (or some moments of it) at specific locations that evolve in time, and which are chosen in such a way to maximize the stability of the method. I will explain the concept of stability that is involved as well as a possible approach for the dynamical sampling. I will illustrate the behavior of the method in several numerical examples.