

Balanced Truncation for a Class of Parabolic Partial Differential Equations

T. Reis¹,

¹TU Hamburg-Harburg, timo.reis@tu-harburg.de

Balanced truncation is one of the most popular model reduction methods for finite-dimensional input-output-systems governed by ordinary differential equations. This technique relies on the solution of two Lyapunov equations.

We will consider an extension of this method for a class of infinite-dimensional systems. We develop a numerical scheme for the finite-rank approximation of the Gramian operators. Based on this, we perform finite-dimensional approximation of infinite-dimensional systems. Error bounds in the H_∞ norm are provided.

In particular, this technique is applied to model reduction of systems governed by parabolic partial differential equations with boundary control and observation.