Beck, Carolyn L.; **Doyle, John**; **Glover, Keith**
Model reduction of multidimensional and uncertain systems. (English) Zbl 0862.93009
IEEE Trans. Autom. Control 41, No. 10, 1466-1477 (1996).

The paper deals with uncertain dynamic systems described by a linear fractional transformation on a repeated scalar uncertainty structure. The main idea is to generalize balanced realizations and balanced truncation model reduction with guaranteed error bounds. The line of reasoning goes through solutions of linear matrix inequalities. The error bounds for model reduction of balanced uncertain systems are presented. Suboptimal algorithms which enable obtaining tighter error bounds by optimization of each of the generalized Gramians separately are given.

Reviewer: A.Świerniak (Gliwice)

MSC:

93B11 System structure simplification
15A39 Linear inequalities of matrices
93B35 Sensitivity (robustness)
93C55 Discrete-time control/observation systems

Keywords:

uncertain dynamic systems; linear fractional transformation; model reduction; linear matrix inequalities

Software:

LMI toolbox; LMITOOL

Full Text: DOI