

## EINLADUNG ZUM MATHEMATISCHEN KOLLOQUIUM

Es spricht

**Prof. Dr. Volker Mehrmann**

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zum Thema:

**Regularity, stability-, and index analysis for dissipative Hamiltonian descriptor systems. Computing the distance to the nearest singular, unstable or high index problem.**

**Abstract:**

Dissipative Hamiltonian systems are an important class of systems that arise in all areas of science and engineering. When the system is linearized around a stationary solution one gets a linear dissipative Hamiltonian system. Despite the fact that the system looks unstructured at first sight, it has remarkable properties. Stability is automatic, spectral structures for purely imaginary eigenvalues, eigenvalues at infinity, and even singular blocks in the Kronecker canonical form are very restricted and furthermore the structure leads to fast and efficient iterative solution methods for associated linear systems. When dissipative Hamiltonian systems are subject to (structured) perturbations, then it is important to determine the minimal allowed perturbations so that these properties are not preserved. The computation of these structured distances to instability, high index or non-regularity, is typically a very hard optimization problem. However, in the context of dissipative Hamiltonian systems, the computation becomes much easier and can even be implemented efficiently for large scale problems in combination with model reduction techniques. We will discuss these distances and the computational methods and illustrate the results via an industrial problem in the context of noise reduction for disk brakes.

**Mittwoch, 17.11.2021, 17:00 Uhr, Raum C 113 im Curiebau**

Alle Interessierten sind herzlich eingeladen.

Das Institut für Mathematik