Univ.-Prof. Dr.-Ing. Utz von Wagner **15.09.2009**
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Ankündigung eines Gastvortrages

zum Thema

Pole Assignment of Friction-induced Vibration Problem for Stabilisation

Termin: **Mittwoch, 04. November 2009, 16:15 Uhr**

Ort: **Technische Universität Berlin**
Institut für Mechanik
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Gastdozent:

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Abstract: Friction-induced self-excited vibration is often governed by a second-order matrix differential equation of motion with an *asymmetric* stiffness matrix. The asymmetric terms are product of friction coefficient and the normal stiffness at the contact interface. When the friction coefficient becomes high enough, the resultant vibration becomes unstable as frequencies of two conjugate pairs of complex eigenvalues coalesce.

Recent work by the author included prediction of complex eigenvalues of the asymmetric systems and a receptance-based inverse method for assigning complex eigenvalues of the asymmetric systems through structural modifications, both based on the receptances of the corresponding *symmetric* system. Numerical examples showed that structural modifications as passive vibration control were not always successful and sometimes impractical in assigning the desired eigenvalues to asymmetric systems. This paper presents a receptance-based inverse method for assigning complex eigenvalues of second-order asymmetric systems through (active) state-feedback control of a combination of active stiffness, active damping and active mass. It is very important to be able to assign negative real parts to stabilise an unstable system.