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## Ankündigung eines Gastvortrages

zum Thema:

### **SOME MECHATRONIC SOLUTIONS TOWARDS SURVEILLANCE OF HIGH SPEED MILLING PROCESSES OF FLEXIBLE DETAILS**

Ort:

**Technische Universität Berlin, Gebäude MS, Raum 107  
Mittwoch, 25. April 2012, 16:15 Uhr**

Dozent:

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Abstract:

During high speed milling of flexible structures a self-excited vibration called *chatter* may be observed as of a great importance. In fact, performance of the process of the *chatter* surveillance shall arise a lot of difficulties. The latter particularly concerns discrete multi-degree-of-freedom systems. Commonly used trial and error procedure for setting required spindle speed in some scenarios is highly not recommended due to economical reasons and because it is not guarantying the success. Purpose of the paper is to present own successful solutions, whose involvement shall make formulation and performance of new mechatronic projects. There are as follows.

**A mechatronic system for building the map** of optimal spindle speeds during high speed milling of curve-shaped flexible details. The developed procedure, which is purposed for presentation, is effective way of the *chatter* surveillance. It contains a few steps whose performance depends upon application of the final element method (FEM), experimental modal analysis (EMA) and computer aided manufacturing (CAM) software.

**A mechatronic approach towards vibration surveillance** during milling of flexible details with a use of the active optimal control. Dynamics of controlled system and optimal control command are described in hybrid coordinates. Computer simulation programme was developed and allowed to confirm the efficiency of vibration surveillance. The developed suitable procedure of vibration surveillance, which is purposed for presentation, comprises some important steps of the mechatronic design.

The mechatronic solutions being applied for surveillance of various high speed milling processes appeared as effective rules for new ideas of mechatronic projects. Meaning of the latter is evidenced by theoretical derivations, computer simulations as well as by experiments on real structures. Due to indicated mechatronic approaches, vibration surveillance resulted more efficient and easier for application.