

## **Simulation of machine process interaction with flexible multi-body simulation**

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### **Abstract**

It would be of great economic interest for the design of machine tools as well as for process planning if the resulting quality of the workpiece is predictable prior to the start of production. The principle procedure of an integrated Simulation of machine tool, workpiece and process in time domain will be illustrated within this presentation.

An analysis and optimisation of the production process is only possible if the interaction of machine tool, workpiece and process can be simulated accurately. The aim of the research project SindBap is to develop an approach for the integrated simulation and optimisation of industrial processes. This co-operative project is founded by the German Federal Ministry of Education and Research. For the integrated analysis and optimisation of industrial production processes time domain simulation models of the process and the machine tool as well as the workpiece are coupled. The cutting forces cause a relative displacement between tool and workpiece. This changes the instantaneous chip area which again affects the cutting process and can lead to unstable cutting conditions or insufficient quality of the workpiece. The presented approach enables the investigation of effects of the machine tool, the workpiece and the process. It will be illustrated comparing simulation and experimental results.