

ON A MATHEMATICAL MODEL FOR HIGH-SPEED MILLING INCLUDING THE DYNAMICS OF MACHINE AND WORK-PIECE

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Abstract: In my talk I will discuss a mathematical model that characterizes the interaction between machine, work-piece, and process dynamics for a complex milling system. While the machine dynamics is modeled in terms of a standard multi-body system, the work-piece is described as a linear thermo-elastic continuum. The coupling of both parts is realized by an empirical process model permitting an estimate of heat and coupling forces occurring during milling.

I will briefly describe the governing equations emphasizing the coupling, then a first analytical result will be outlined concerning the well-posedness of the system. I will conclude with some numerical results showing the dynamics of this complex thermo-mechanical system.

(joint work with Krzysztof Chelminski (Warsaw University of Technology) and Oliver Rott, (WIAS))