

# An integrated CNC system for chatter suppression in turning

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## ABSTRACT

Self-excited chatter vibrations are one of factors affecting the reduction of cutting efficiency, especially while machining highly compliant machine parts. Their occurrence can be limited by the proper technological parameters selection. These parameters can be determined by analysing the cutting process stability, which requires knowledge of the machine-tool-workpiece system dynamic properties. Normally, these properties are determined experimentally, which is troublesome in industrial practice. This article presents a method in which dynamic properties are calculated by single-board computer integrated with a Computer Numerical Control (CNC) system, with no need to carry out additional experimental tests. It is possible with the receptance coupling approach which allows for obtaining the workpiece geometry by analyzing the machining program and then determining the machine tool – workpiece system dynamic properties. These properties are the input to the presented algorithm that facilitates the selection of cutting parameters enabling stable turning of highly compliant machine parts. The presented system is dedicated to turning but can also be adapted to determine the stability of milling with flexible tools.

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