

This paper presents a new Receptance Coupling Substructure Analysis (RCSA) approach. The technique represents a valid instrument to predict Frequency Response Function, and consequently chatter free cutting conditions, of a not previously tested mill. The proposed RCSA methodology exploits experimental dynamic compliance measurements and the Finite Element (FE) model of a tool to estimate, through a new defined formulation, both the matrices of receptances of the spindle-tool holder assembly and the tool-tool holder connection stiffness. These data, together with the FE model of any new desired mill, can be used to estimate the relative tool tip dynamic compliance. The suggested formulation basically overcomes the drawbacks in the estimation of "rotation/torque" receptances that often limits the accuracy of the classical RCSA. The proposed innovative approach was experimentally tested and validated.