World Academy of Science, Engineering and Technology
International Journal of Mechanical and Materials Engineering
Vol:10, No:08, 2016

Spectral Coherence Analysis between Grinding Interaction Forces and the Relative Motion of the Workpiece and the Cutting Tool

Authors : Abdulhamit Donder, Erhan Ilhan Konukseven

Abstract : Grinding operation is performed in order to obtain desired surfaces precisely in machining process. The needed relative motion between the cutting tool and the workpiece is generally created either by the movement of the cutting tool or by the movement of the workpiece or by the movement of both of them as in our case. For all these cases, the coherence level between the movements and the interaction forces is a key influential parameter for efficient grinding. Therefore, in this work, spectral coherence analysis has been performed to investigate the coherence level between grinding interaction forces and the movement of the workpiece on our robotic-grinding experimental setup in METU Mechatronics Laboratory.

Keywords : coherence analysis, correlation, FFT, grinding, hanning window, machining, Piezo actuator, reverse arrangements test, spectral analysis
Conference Title : ICMMM 2016 : International Conference on Machining and Machinability of Materials
Conference Location : Venice, Italy
Conference Dates : August 08-09, 2016