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Optimization of Machining Process Through Response Surface and Canonical Analysis

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Abstract: Statistical methods, using mathematical models as complement, are useful approaches for process optimization. In this paper Response Surface Methodology (RSM) with Canonical Analysis was applied to achieve the optimization; Analyzed data were obtained from a machining process. Results suggest that Central Composite Design used as complement of Canonical Analysis are useful methods to predict the interest point and confidence tools for modeling and optimization. The canonical analysis for saddle point, is a good tool for optimization, when we know and control the input variables; then Central Composite Design with Canonical Analysis can be an alternative method to data analyze, when the regression model from the experimental design is adequate or satisfies the assumptions with the statistical tests and it is fulfilled by the evaluation criteria of the statistical model.

Keywords: Response Surface Methodology, Canonical Analysis, Optimization