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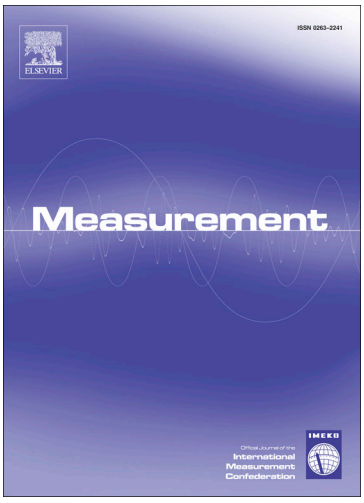

Comment to paper entitled "Experimental investigation of machinability characteristics and multiresponse optimization of end milling in aluminium composites using RSM based grey relational analysis," Measurement 105 (2017) 78–86

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Comment to paper entitled "Experimental investigation of machinability characteristics and multiresponse optimization of end milling in aluminium composites using RSM based grey relational analysis," Measurement 105 (2017) 78–86.

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Abstract

The paper entitled "Experimental investigation of machinability characteristics and multiresponse optimization of end milling in aluminium composites using response surface methodology (RSM) based grey relational analysis (GRA)". The Authors adopted RSM based grey relational method to achieve high productivity in terms of maximum material removal rate MRR and least surface roughness, tool wear and cutting forces. Experimental design was made using RSM (central composite design) and responses were measured according to standard methods. In this study, authors had proposed the optimized Grey relational grade (GRG) ranking for machinability characteristics. However, there are some errors in their analysis, which are likely to affect the significance of their proposed ranking. So, this comment highlights the miscalculations and gives the corrected results.

Keywords

Comment, Grey Relational analysis, Multi-response optimization.

1. Introduction

Hemmatollah Pirdashti et al investigated the machinability characteristics of end milling process. Aluminium alloys Al7075 was used as a workpiece materials with different composition of SiC. During the end milling process, twenty-seven experiments were performed. Response surface methodology (RSM) is a multi-response optimization technique, so to convert multiobjective response into a single response problem, the authors have analyzed the experimental data using RSM based RGA technique. During the GRA analysis the authors had adopted three steps to get grey relational grade (GRG) [1].

These three steps are as follows

1. Experimental data were first normalized ranging from zero to one.
2. Grey relational coefficient was estimated based on normalized experimental data.
3. Overall grey relational grade (GRG) was obtained by averaging the grey relational coefficients corresponding to each selected response. The combination of parameters which has a higher value of grey relational grade (Rank 1) is known to be closer to the optimal parametric setting.

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