

## Editorial: Micromachining

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Traditionally, manufacturing had been considered more of an art than science. However, it is one of the primitive and innovative activities of the human civilization. The rapid developments in recent years of the advanced technological industries, namely aerospace, automobile, nuclear power, missiles and similar others have been accompanied by the developments in the field of materials such as super alloys, stainless steel, titanium and its alloys, nimonics, ceramics, composites, etc., having high strength to weight ratio and low machinability. Production of complicated geometries with high dimensional accuracy in such materials becomes extremely difficult with the conventional machining methods in general and miniature components in particular. Production of miniature parts inevitably requires the application of advanced micromachining techniques.

The objective of this special issue of *IJAMT* is to present latest developments in the area of advanced micromachining techniques. The revised and extended version of the research papers presented in the 3rd International and 24th AIMTDR Conference held at Visakhapatnam (India) in Dec. 13–15,

2012 have been included in this issue. The authors explored the various interesting aspects of electrochemical micromachining, electric discharge micromachining, laser beam micromachining. It is evident from these papers that these processes are suitable for producing intricate details in difficult-to-machine materials for miniaturization of the products. Apart from these micromachining technologies, some authors have reported application of various optimization and modeling techniques for micromachining processes which are very helpful for obtaining better insight of the processes.

This special issue has been divided in four sections: electrochemical micromachining (ECMM), electric discharge micromachining (EDMM), laser beam micromachining and miscellaneous. Electrochemical micromachining and its hybrid processes (section 1) have three papers dealing with the fabrication of microfeatures on macro and micro products. The first paper presents the application of ECMM technique for the production of micro tools and features for various applications. The second paper presents the developments in ECMM process for drilling of micro holes. The third paper reports the application of hybrid process (electrochemical spark machining) in electrically non-conducting materials like glass fiber epoxy composites. Section 2 has seven papers out of which the first three deal with wire EDMM and remaining four with electric discharge micromachining. First paper of this section presents the analysis of breakage of wire in wire EDMM process during machining of metal matrix composites while the second one presents the optimization related issues of wire EDMM. The third paper gives an interesting application of wire EDMM in the production of micro-sized threads. Next two papers of this section present optimization-related issues of EDMM. The last two papers of this section give application of numerical

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method in the analysis of EDMM and modeling of a hybrid process (EDM+End milling). Section 3 has one paper which is related to the hole characteristics optimization in LBM. Section 4 has only two papers, one on simulation of abrasive flow finishing process while the last one presents some findings on hard machining.

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