



Microstructure Change and Mechanism during the Metal Machining Process, Modeling, and Applications

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Message from the Guest Editors

Machining parameters, tool geometries, and metal microstructure all have significant effects on the dynamics of velocity, deformation, stress, and temperature in shear zone. The physics-based analysis and predictive model on shear straining, thermal kinematics, and material constitutive relation can help to comprehend the coupling effects between thermal and mechanical loadings and the related materials behavior evolutions. Metal microstructure changes in machining include recrystallization, grain growth, crystallization evolution, and phase transformation. The machining process is significantly influenced by the material microstructure as the tool cutting through grain boundaries. In return, microstructure of metal keeps changing during the machining process. Therefore, the microstructure changes and machining process are affected iteratively. It is necessary to understand this mechanism to better predict the machining process.

For this Special Issue in *Metals*, we welcome reviews and articles regarding modeling and applications of microstructure change and mechanism during the metal machining process.





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Message from the Editorial Board

Metallic materials play a vital role in the economic life of modern societies; contributions are sought on fresh developments that enhance our understanding of the fundamental aspects related to the relationships between processing, properties and microstructure – disciplines in the metallurgical field ranging from processing, mechanical behavior, phase transitions and microstructural evolution, nanostructures, as well as unique metallic properties – inspire general and scholarly interest among the scientific community.

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