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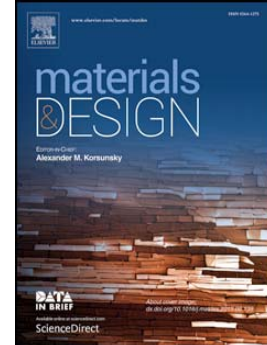
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# Crystal plasticity finite element modeling of crystallographic textures in simple shear extrusion (SSE) process

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## Abstract:

The main objective of this study is characterization and modeling of crystallographic textures in one of the most recent severe plastic deformation methods named as the simple shear extrusion (SSE) technique. In the crystal plasticity finite element (CPFE) models, three polycrystalline aggregates as the representative volumes at the central region of a sample are subjected to deformation that simulates the real deformation histories experienced by the SSE process. The CPFE models capture not only the complex interactions among the constituent individual crystals of the polycrystal, but also they capture the inherent boundary conditions during SSE processing. The experiments confirm the reliability of the predicted textures which acknowledge the accuracy of the used CPFE models to understand the effect of the complex strain history on the texture evolution in the SSE process.

**Keywords:** Simple shear extrusion (SSE), Crystallographic texture, Crystal plasticity finite element modeling

## Introduction

During metal forming processes, rotation and distortion of the crystals to the preferred orientations result in morphological and crystallographic textures [1]. It is experimentally well

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