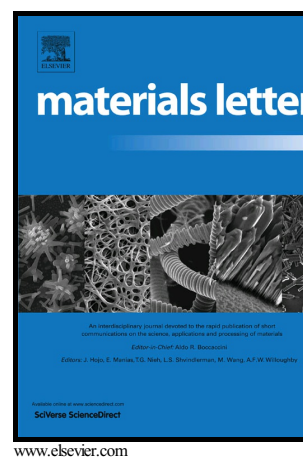


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Explore the anisotropic indentation pile-up patterns of single-crystal coppers by crystal plasticity finite element modelling

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Abstract

We report a new in-depth explanation of the anisotropic pile-up phenomenon based on the plastic slip theory. A crystal plasticity finite element method (CPFEM) model which considers plastic slips and lattice rotations as the only deformation mechanism has been developed to investigate the anisotropic pile-up behaviour of (001), (011) and (111) initially orientated single-crystal copper (Cu) undergoing nanoindentation. It is concluded that the activation of different slip systems contributes to the anisotropy of pile-up patterns.

Keywords: CPFEM; nanoindentation; pile-up; single-crystal Cu

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