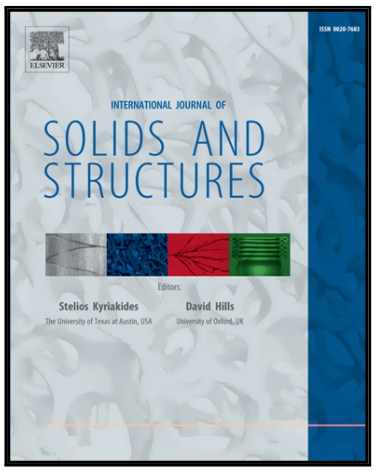

A yield criterion for cubic single crystals

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A yield criterion for cubic single crystals

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Abstract

In this paper a three-dimensional analytical criterion for description of the onset of plastic deformation in cubic single crystals is presented. The criterion is pressure-insensitive and form-invariant to any transformation belonging to the symmetries of the material. Specialization of this criterion for each class of the cubic system is presented. For most metallic single crystals, the criterion involves five independent parameters, which can be determined based on the yield stresses in different crystal orientations. Comparisons with single crystal data show that the criterion can successfully describe the difference in yielding anisotropy between FCC crystals.

Keywords: Yield criterion of single crystals; theory of representation; FCC single crystal data