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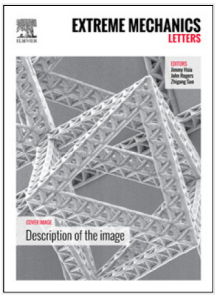

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PII: S2352-4316(16)30029-3
DOI: http://dx.doi.org/10.1016/j.eml.2016.02.005
Reference: EML 116

To appear in: *Extreme Mechanics Letters*

Received date: 13 November 2015
Revised date: 3 February 2016
Accepted date: 3 February 2016

Please cite this article as: Y. Zou, P. Kuczera, W. Steurer, R. Spolenak, Disappearance of plastic anisotropy in decagonal quasicrystals at small scales and room temperature, *Extreme Mechanics Letters* (2016), http://dx.doi.org/10.1016/j.eml.2016.02.005

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Disappearance of plastic anisotropy in decagonal quasicrystals at small scales and room temperature

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Abstract

Decagonal quasicrystals (DQCs), as a class of two-dimensional quasicrystals, are known to be highly anisotropic in most of their physical properties. Here we show that their plastic anisotropy can be considerably reduced, and even eliminated, when they are scaled down to the sub-micrometer regime and deformed at room temperature. The reduced plastic anisotropy might be attributed to both size and temperature dependence of dislocation activities. This finding may shed light on the exploration of new deformation mechanisms for quasicrystal plasticity in an unknown size and temperature regime.

Keywords: quasicrystals, plastic deformation, anisotropy, size effect, micro-compression

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