Abstract Submitted
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Anisotropy of Step Stiffness and Its Implications[1] T. L. EINSTEIN, T. J. STASEVICH, F. SZALMA, U. of Maryland, College Park — Based on a lattice gas viewpoint, we have derived [2] a simple expression for the [in-plane] orientation dependence of step stiffness which is accurate for, e.g., noble metals at room temperature except near orientations with close-packed steps. We have extended our result to deal with this narrow but important range of angles. In addition to previous applications to Cu (001) and (111), we consider, e.g., simulations of fluctuations of island edges on Pb (111) in conjunction with experimental data.[3] We find that the numerical data in an Arrhenius plot is dominated by the contributions from highly kinked regions of the step edge. We emphasize that our expression is far superior to the standard phenomenological forms and is continuous and differentiable, so well suited to continuum models and finite-element calculations.

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[2]T. J. Stasevich et al., Phys. Rev. B 70, 245404 (2004); 71, 245414 (2005)
[3]F. Szalma et al., Phys. Rev. B 71, 035422 (2005) & to be published.

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