Abstract Submitted
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Using Curved Crystals to Study Terrace-Width Distributions.[1]
THEODORE L. EINSTEIN, University of Maryland — Recent experiments on curved crystals of noble and late transition metals (Ortega and Juurlink groups) have renewed interest in terrace width distributions (TWD) for vicinal surfaces. Thus, it is timely to discuss refinements of TWD analysis that are absent from the standard reviews. Rather than by Gaussians, TWDs are better described by the generalized Wigner surmise, with a power-law rise and a Gaussian decay, thereby including effects evident for weak step repulsion: skewness and peak shifts down from the mean spacing. Curved crystals allow analysis of several mean spacings with the same substrate, so that one can check the scaling with the mean width. This is important since such scaling confirms well-established theory. Failure to scale also can provide significant insights. Complicating factors can include step touching (local double-height steps), oscillatory step interactions mediated by metallic (but not topological) surface states, short-range corrections to the inverse-square step repulsion, and accounting for the offset between adjacent layers of almost all surfaces. We discuss how to deal with these issues. For in-plane misoriented steps there are formulas to describe the stiffness but not yet the strength of the elastic interstep repulsion.

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