

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Multi-atom induced step instability in Fe/Cu(100) growth¹ YUN-SIC SHIM, JACQUES AMAR, University of Toledo — We examine the step instability observed in Fe deposition on a Cu(100) vicinal substrate [1] in which it was found that a very small Fe coverage (0.035 ML) leads to a dramatic change in the step morphology from relatively straight [100] steps to a mixture of [100] and [110] step-edges. While this has been previously attributed to stress-induced step erosion which arises as a result of Fe embedding in Cu(100), our temperature-accelerated dynamics simulations indicate that instead it is due to a variety of complex low-barrier multiatom interlayer diffusion (MID) processes at step edges which are enhanced by strain effects as well as the existence of strong Fe-Fe and Fe-Cu interactions. Combined with the relatively high energy barrier for MID at [110] steps as well as the moderate mobility of Fe monomers on Cu(100) these processes lead to [110] step formation.

¹This research was supported by NSF grant DMR-1410840.

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Date submitted: 10 Nov 2016

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