Abstract Submitted
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A Method for Studying Atomic Diffusion by STM Tip-Crash Induced Vacancy Island Coalescence[1] R.E. LAKE, Clemson University, A.P. LANGE, University of California, Santa Cruz, M.P. RAY, C.E. SOSOLIK, Clemson University — The study of vacancy and adatom island motion on single crystal metals with the scanning tunneling microscope (STM) has explained many of the underlying atomic diffusion mechanisms responsible for movement of atoms on a surface. We present a new method for vacancy island creation at room temperature using a controlled mechanical tip-surface interaction. The method allows us to control the relative positions and initial sizes of vacancy islands with respect to one another and to surface defects. Complicated and closely spaced vacancy island configurations can also be engineered. This enhances our ability to collect statistics on the movement of the macro-scale vacancy islands and distinguish between mass transport channels. To demonstrate the technique, time series analysis of coalescence events on the surface of Ag(111) is presented. Diffusion coefficients of the Ag surface atoms obtained with this method are in general agreement with previous stochastic methods for creating vacancy islands such as low-dose sputtering [1]. [1] M. Eßer, K. Morgenstern, G. Rosenfeld, G. Comsa, Surf. Sci. **402-404**, 341 (1998).

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