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Automated Tracking of Nanometer-Scale Feature Evolution Using an STM RUSSELL LAKE, Clemson University, ADAM DEAN, College of Charleston, NIRU MAHESWARANATHAN, South Carolina Governer's School for Science and Mathematics, CHAD SOSOLIK, Clemson University — Time-resolved measurements of vacancy pits and adatom islands on monatomic metallic surfaces (e.g. Ag(111) [1]) have provided valuable insight into the underlying atomic diffusion processes that drive dynamics at nanometer length scales. Utilizing our variable temperature scanning tunneling microscope or STM, we are extending this probing method to more complex systems, such as the AuCu and NiAl alloys. To increase the rate of successful data acquisition for these measurements, we have developed automated tracking routines that allow for the continuous monitoring of evolving surface features with minimal operator involvement. Post-acquisition image analysis is further enhanced utilizing feature detection algorithms. Current proof-of-concept results spanning several hours of acquisition time on single crystal metal surfaces are presented. [1] K. Morgenstern et al., Phys. Rev. B 63, 045412 (2001).

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