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Atomically and Time Resolved Pattern Formation: S on Submonolayer Ag/Ru(0001) BOGDAN DIACONESCU, KATRSTEN POHL — Strained metallic interfaces can lead to highly ordered arrays of misfit dislocations that can be used as an elegant patterning technique for growing arrays of clusters with specific size and densities. Deposition of S on submonolayer Ag films on Ru(0001) transforms the short herringbone dislocation pattern, with a 60Å x 40Å unit cell, into a large scale ordered triangular array of S filled vacancy islands 50Å apart as shown by STM and LEED. In this process S partially relieves the strain in Ag film as seen by the relaxation of the threading dislocation network. Atomic structure of the S islands and the coverage dependence of the atomic structure of S/Ru(0001) and S islands size is revealed by STM imaging. The low S coverage regime shows a transition from isolated, highly mobile S islands as seen through time resolved STM to an ordered islands array. As the S coverage increases beyond 0.33 ML on the Ru(0001) terrace, the ordering of the 2D S islands array is destroyed, and the compressed S phase pushes Ag onto a second layer. Supported by NSF-CAREER-DMR-0134933 and ACS-PRF-37999-G5

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