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Two-dimensional island ripening on the basal plane of ice SHU NIE, NORM BARTELT, KONRAD THURMER, Sandia National Labs, SANDIA NATIONAL LABORATORIES TEAM — Despite the importance of ice surfaces to many natural phenomena there have been no accurate measurements of *surface* self-diffusion coefficients of ice. To provide this needed basic information, we applied the newly discovered capability of STM to image thick ice films on Pt [1], and tracked the evolution of 2-dimensional ice islands grown on the basal plane of ice. Uniform 5 nm thick ice films grown at 145 K were used as a template to study surface self-diffusion. By depositing a fraction of a monolayer of water onto these films at 115 K, we created arrays of two-dimensional islands with diameters of 5-10 nm. Remarkably, when annealed to temperatures between 115 and 135 K, these island arrays coarsened. By fitting the average island area to the $t^{2/3}$ growth law expected for diffusion-controlled ripening we extract an activation energy for surface self-diffusion of 0.4 $\pm$0.1 eV, which is on the order of the energy of a hydrogen bond and much less than the value measured for bulk diffusion (0.7 eV) [2]. This work is supported by U. S. DOE, OBES, Division of Materials Sciences under contract DE-AC04-94AL8500. [1] K. Thürmer and N. C. Bartelt, Phys. Rev. B **77**, 195425 (2008). [2] D. E. Brown and S. M. George, J. Phys. Chem. **100**, 15460 (1996).

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