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Surface Mobility Difference between Si and Ge and its Effect on Growth of SiGe Alloy Films and Islands LI HUANG, Fudan University, China, GUANGHONG LU, University of Utah, XINGAO GONG, Fudan University, China, FENG LIU, University of Utah — Based on first-principles calculations of surface diffusion barriers, we show that on a compressive Ge(001) surface, the diffusivity of Ge is $10^2 - 10^3$ times higher than that of Si in the temperature range of 300 to 900 K; while on a tensile surface, the two diffusivities are comparable. Consequently, growth of a compressive SiGe film is rather different from that of a tensile film. The diffusion disparity between Si and Ge is also greatly enhanced on the strained Ge islands compared to that on the Ge wetting layer on Si(001), explaining the experimental observation of Si enrichment in the wetting layer relative to that in the islands.

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