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Nanomanipulation with dynamic AFM IVAN STICH, PETER DIESKA, Slovak University of Technology, RUBEN PEREZ, Universidad Autonoma de Madrid — Nanomanipulation [1] is one of the most important current issues in dynamic AFM (DAFM). Following the first vertical manipulation on Si(111)-(7x7) [1] a lateral manipulation was documented by interchange manipulation of Sn and Ge adatoms on the Ge(111)- c(2x8) surface [2]. However, the atomistic details and nature of these processes remain unclear. In order to shed light on these experiments we have performed DFT simulations on two model systems: (1) anionic antisite defect on the InP(110) surface [3], and (2) the Sn-covered Ge(111)-c(2x8) surface. In (1) the P defect atom moves vertically in a double well potential with two minima, which opens the possibility to vertically manipulate the defect atom from one minimum into the other. We will addresses issues such as whether the experiments can be performed in both attractive and repulsive interaction regimes and whether the basic atomistic mechanism is related to lowering of the barriers by the presence of the tip, or by a purely mechanical effect where the atom is pushed over a barrier. In (2) we will show how presence of the tip can affect the charge transfer processes between the different dangling bonds and hence induce atomic manipulation. [1] N. Oyabu et al., Phys. Rev. Lett. 90, 176102 (2003) [2] Y. Sugimoto et al., Nature Mater. 4, 156 (2005); N. Oyabu et al., Nanotechnology 16, S112 (2005). [3] P. Dieska, I. Stich, R. Perez, Phys. Rev. Lett. 95 126103 (2005)

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