Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Kinetic pairing of steps OLIVIER PIERRE-LOUIS, Labo. Spectro. Phys., UJF Grenoble, France., JEAN-JACQUES METOIS, CRMCN, Luminy, Marseille — A novel instability of crystal surfaces, the kinetic pairing of identical atomic steps, is investigated both theoretically and experimentally. We show that this instability can appear only when the dynamics are nonlocal. We study in more details the case of Si(111) at high temperature under electromigration. In this case, the non-locality comes from the transparency of the steps. The instability was observed in experiments. Comparison with the theory indicates that the step transparency kinetic coefficient is negative. With the help of a phase field model, we find that this result is the consequence of a faster diffusion of atoms in the step region. [1] O. Pierre-Louis and J.-J. Métois, Phys. Rev. Lett. 93, 165901 (2004).

Olivier Pierre-Louis
Labo. Spectro. Phys., UJF Grenoble, France.

Date submitted: 26 Nov 2004 Electronic form version 1.4