Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Surface structure of alumina ultrathin film grown on Ni3Al (111) studied by nc-AFM CLAUDE R. HENRY, CLEMENS BARTH, GUIDO HAMM, CRMCN-CNRS, Campus Luminy, 13288 Marseille, CLUSTER GROUP TEAM — Alumina ultrathin films grown by high temperature oxidation of a Ni3Al (111) surface have the peculiarity to be nanostructured. Indeed, as shown previously by the group of C. Becker [1], they present two hexagonal structures with lattice parameters of 2.4 and 4.16 nm. However, no atomic resolved structure was evidenced by this STM study. In the present study we used the same preparation technique to grow the alumina film. The surface structure of the film was studied, in situ under UHV, by nc-AFM. By this technique we confirm the presence of the two structures and we clearly show that the larger one is the basic structure of the topmost layer of the film. The 2.4 nm structure is a sub-lattice of the 4.1 structure. These two structures provide two different local environments that could explain why metals condensed on this film form hexagonal lattice with a parameter of 2.4 or 4.1 nm. Atomic resolution has been obtained showing that the topmost surface is terminated by a distorded hexagonal lattice of atoms (most probably oxygen). The relationships betwen the atomic lattice and the two superstructures have been derived from the nc-AFM measurements. We will discuss on the possible origin of the complex structure of this films. [1] S. Degen et al. Surf. Sci. 576(2005)L57

Claude R. Henry
CRMCN-CNRS, Campus Luminy, 13288 Marseille

Date submitted: 27 Nov 2005 Electronic form version 1.4