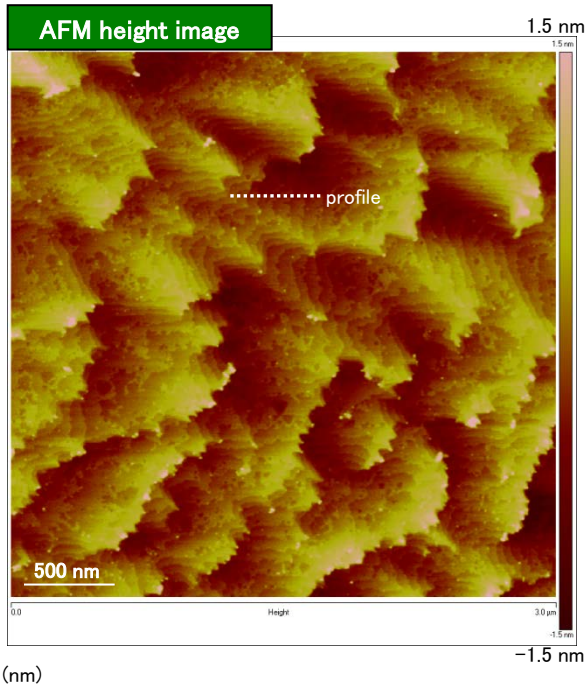
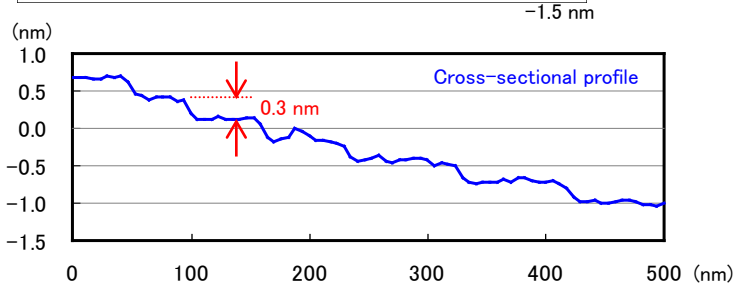
Least noise-floor AFM in the world !
Roughness analysis of wafers by AFM

In Toray Research Center, Inc., least noise-floor level in AFM measurements can be achieved by the high-performance active-type anti-vibration table and the converted measurement room with noise reduction. As a result, it is possible to estimate accurate quantitative values of roughness and discriminate the slight difference of them.

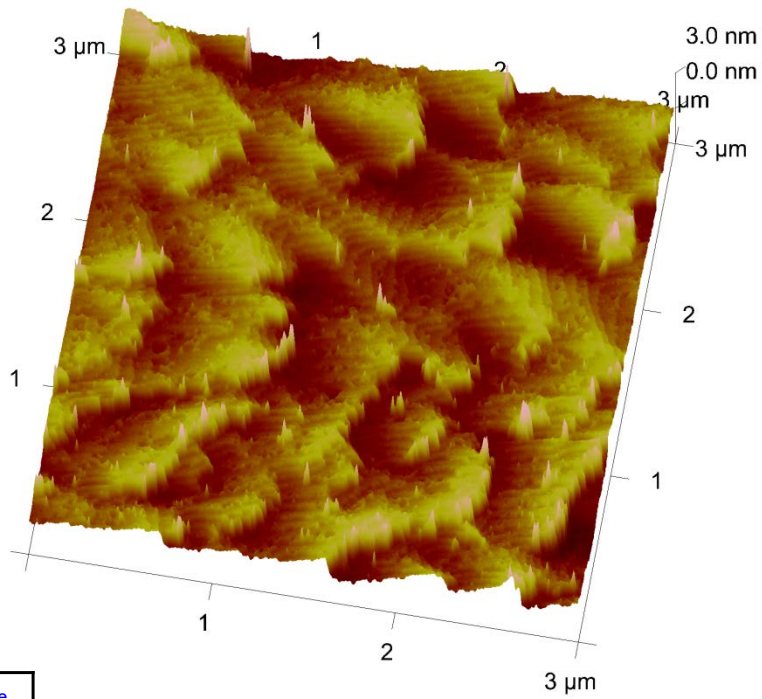
Example : Si(111) Monoatomic Step

AFM height image





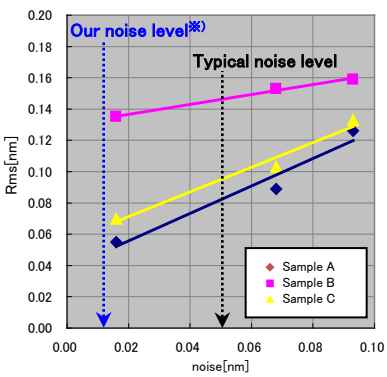
AFM three-dimensional image



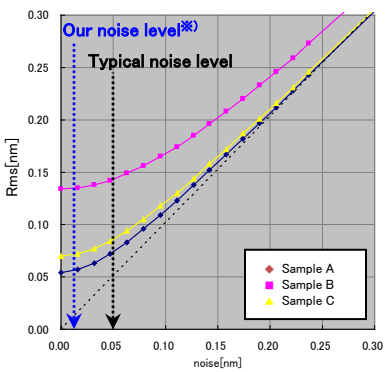
Monoatomic step with 0.3 nm height can be clearly observed !

Reduction of noise floor : Evaluation of accurate surface roughness(Rms)

In semiconductor industry, AFM is frequently used for the evaluation of micro roughness of wafer surfaces. In such measurements, reduction of noise floor is the most important challenge to obtain high-quality noiseless AFM images. In our laboratory, least noise-floor level in the world can be achieved by the high-performance active-type anti-vibration table and the converted measurement room with noise reduction.



Relation between Rms of samples and noise floor



Resulted simulation of the left graph

Characteristics of our AFM:

- Height resolution is 0.01 nm.
- Slight difference of quantitative values can be discriminated.
- Accurate quantitative values (Ra, Rms) are estimated.

※) Noise level of our AFM : Rms=0.013 nm
(Dimension Icon, Bruker AXS)

Toray Research Center, Inc.