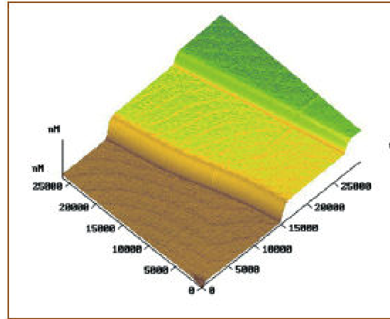
Si-STEP Calibration Sample
Product No. 629-89



Topographic image of Si-STEP surface.

Product description.

The Si-STEP silicon test sample with echeloned pattern for AFM applications is designed on the basis of a silicon (111) surface with verified distribution of monoatomic steps for height calibration in angstrom and single nanometer intervals. The Si-STEP calibration sample can also be sued as a flat sample substrate for nanoparticles.

Specifications.

Structure:	Silicon with steps
Average interstep distance:	0.5-2µm
Single atom step height::	0.314nm
Mis-orientation from (111):	~1 degree
Inter-step roughness:	0.06nm
Chip size:	1 x 4 x 0.3mm

Handling.

For ease of use we advise to attach the Si-STEP calibration sample to an appropriate size metal AFM disc. Store in a dust-free environment at room temperature.

Instructions for use.

To calibrate an AFM system on the Z-axis, the procedure is as follows:

1 – Fix the Si –STEP calibration sample on the AFM holder
2 – Approach to the Si-STEP surface and capture a topography AFM image with a scan size of 20x20µm or larger. After obtaining the image with step sequences as shown in Fig. 1. Choose the area of ~5x5µm between any two steps and capture an AFM image with regular monoatomic steps only.
3 – Apply the software filter “Plane Subtraction” to the image, see Fig.2
4 – The next step is to get the height spectra using the AFM software
5 – Measure the interpeak distance. To calibrate your AFM, change the calibration constant untill the inter-peak distance becomes 0.31nm. Please be aware that the experimental error on the measurement is half width at half height, so try to obtain the peaks as narrow as possible, see Fig. 3.

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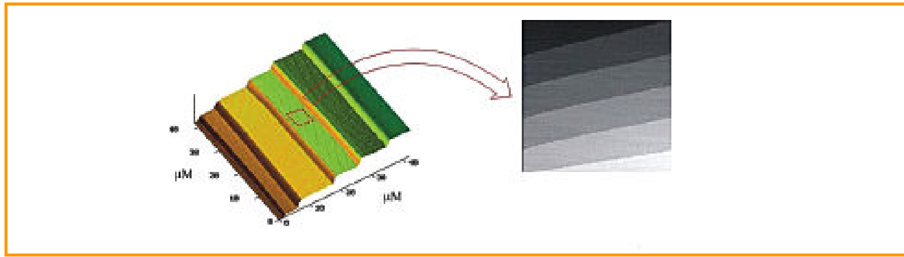

Fig.1. 43x43µm topographic image of Si-STEP surface. Fig. 2. 5x5µm topographic AFM image of Si-STEP plane subtractions.

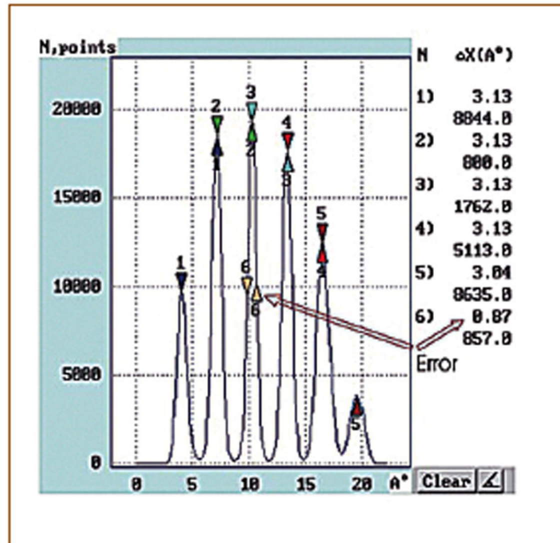

Fig.3. Height spectra with ~0.31nm interpeak distance. Experimental error ~0.09nm.

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