

DESIGN AND PERFORMANCE OF METROLOGY SCANNING PROBE MICROSCOPE

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Abstract

We present design and performance of our custom built metrology scanning probe microscope. The device is a national standard for nanometrology and is located in Czech Metrology Institute, regional branch Brno. The main idea for construction of such a device was to have a clear traceability chain and to overcome limitations in accuracy of commercial SPMs. The most critical component in our system is the 3D stage the position of which is monitored using six independent interferometers allowing for compensation of parasitic rotations in all three axes.

In our contribution we discuss the design of main components of the device and demonstrate that it is capable of resolving individual atomic steps on Si (111) surface having size of 0.3 nm.

Keywords: Scanning probe microscopy, traceability, national standard

Author did not supply full text of the paper.