
AFM tip reconstruction with known tip characterisers in Python environment

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Nanometrology covers a wide range of techniques for the characterization and measurement of a wide range of materials at the nanoscale. In particular, Atomic Force Microscopes (AFMs) are used to measure topographies with high resolution on the Z axis. The tip of the microscope plays a fundamental role in the reconstruction of the real image, and its shape must be reconstructed before analysing the collected data.

Several methods for AFM tip reconstruction are presented in literature, which can be divided into two main approaches for *in situ* characterisation, which are blind reconstruction and known tip characteriser techniques.

In [1, 2, 3] a geometrical method for tip reconstruction, using TiO₂ nanosheets, tobacco mosaic viruses as known characterizers was described.

In this work, we generalize this approach to any ideal structure, and we implement routines for the procedural generation of height maps with multiple tip characterisers. Our goal is to create a Python module that helps generating the ideal topography of the tip characteriser, and then reconstructs the tip shape by eroding the real measurement with the generated structure.

References

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