

Simulation of nanoindentation of gold nanorods

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The atomic force microscope (AFM) can be used to measure mechanical properties of nanoscale objects, which are too small to be studied using a conventional nanoindenter. The contact mechanics at such small scales, in proximity of free surfaces, deviate substantially from simple continuum models. We present results from atomistic computer simulations of the indentation of gold nanorods using a diamond AFM tip and give insight in the atomic scale processes, involving creation and migration of dislocations, leading to the plastic deformation of the sample under load, and explain the force–distance curves observed for different tip apex radii of curvature, as well as different crystallographic structure and orientation of the gold nanorod samples.

References

- [1] B. Reischl, A. Kuronen, and K. Nordlund, *Materials Research Express* **1**, 045042 (2014)