

Manipulation and characterization of individual nanostructures

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When the structural unit of material is reduced to nanoscale dimensions, its specific properties and behavior start to depend on size and shape. It opens a route for fine-tuning the characteristics of materials and systems by precisely engineering the size and geometry of the structures. At the same time, it raises significant challenges both in theoretical description and in experimental investigation of nanoscale materials. Thus, reliable methods for characterization of individual nanostructures alongside with appropriate models capable of accounting for size and geometry effects are needed.

Our activities are related to the characterization and manipulation of individual nanostructures inside a scanning electron microscope (SEM) with the main emphasize on mechanical and tribological properties. The method is based on commercial and home-built nanomanipulation platforms equipped with a force sensor.

In my talk, I will give a brief overview of our nanomanipulation activities and will present chosen findings [1-4] related to unusual behavior of nanostructures in nanomechanical tests.

Characterization method based on a manipulation of individual nanostructures inside SEM provides a valuable real-time information on dynamic processes like crack formation and propagation. It also enables the assembly of nanoscale devices.

References

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