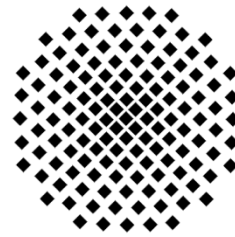


Stuttgarter Physikalisches Kolloquium

Fachbereich Physik, Universität Stuttgart
Max-Planck-Institut für Festkörperforschung
Max-Planck-Institut für Intelligente Systeme

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Dienstag, 19. Oktober 2021

16:15 Uhr

V57.01

Universität Stuttgart, Pfaffenwaldring 57, 70569 Stuttgart-Vaihingen

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Dynamic DNA nanotechnology driven by electrical fields

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Abstract

In this talk, the focus will be put on the manipulation of DNA-based nanodevices using electrical fields. We show that externally applied fields can be used to switch a “nanorobotic arm” between different positions on a molecular platform, which is characterized using single molecule tracking and super-resolution microscopy.

We characterize the interplay of electroosmotic and electrophoretic effects in the operation of such systems and also discuss how different design choices influence the mechanical properties of the system. With a size of ~ 100 nm some of the properties of our nanorobotic system are better characterized in a Brownian dynamics framework, while others behave almost like “classical” mechanisms known from mechanical engineering.