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dsDNA and nanobubble studies using solid-state nanopores RALPH SMEETS, Kavli Institute of Nanoscience Delft, ULRICH KEYSER, Universität Leipzig, DIEGO KRAPF, MENG-YUE WU, NYNKE DEKKER, CEES DEKKER, Kavli Institute of Nanoscience Delft — DNA transport through fabricated solid-state nanopores is studied at various salt concentrations. dsDNA translocation at 1M KCl results in current blokkades, whereas by contrast current enhancements are observed at low salt concentrations. These current changes can be understood by taking both the volume and the counter ions of the molecule into account. Nanopore conductance and noise is studied as a nanopore is moved through a laser beam. The resulting conductance profiles show strong variations in the magnitude of the conductance and the low-frequency noise. In addition, we measure an unexpected double-peak conductance profile. A nanometer-sized gaseous bubble (nanobubble) explains this profile. Our data suggest that such nanobubbles act as the dominant source of low-frequency noise and conductance variability. Currently, translocation of RecA-coated DNA is employed to detect local protein structures and test translocation models. We will report on the latest status of these experiments.

Ralph Smeets
Kavli Institute of Nanoscience Delft

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