

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

The Effects of Bio-functionalization on Solid-state Nanopore Transport – Theory and Experiments on DNA¹ YALING LIU, ABHIJIT RAMACHANDRAN, Department of Mechanical and Aerospace Engineering, SAMIR M. IQBAL, Department of Electrical Engineering, NanoFAB Center, University of Texas at Arlington — Solid-state nanopore channels have been reported recently to show selectivity for various target bio-molecules. The surfaces of nanopore channels are functionalized to achieve such selectivity. The organic molecule coatings alter the behavior of molecular transport as well as change surface energies, chemical and physical properties, and make these more bio-compatible. We present theoretical considerations of DNA-modified nanopore channels which treat the functional molecules on the surface as a combination of series of potential sites. The potential function depends on the physical interactions of two ssDNA molecules. The simulated DNA trajectories and translocation speeds under various test conditions are consistent with the reported experimental data.

¹This work is supported by University of Texas at Arlington Research Enhancement Program.

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Date submitted: 20 Nov 2008

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