Abstract Submitted
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The effect of ion beam sculpted nanopore size and shape on DNA translocation[1] RYAN ROLLINGS, University of Arkansas, EDWARD GRAEF, University of Texas at Dallas, DENIS TITA, SANTOSHI NANDIVADA, MOURAD BENEMARA, JIALI LI, University of Arkansas — Solid state nanopore based devices can sense single biomolecules in their native environment. Nanopore thickness plays a crucial role in the signal to noise ratio of current blockades caused by biomolecule translocation and ultimately limits the spatial resolution of the nanopore device when discriminating small features on DNA and protein molecules. Low energy ion beam irradiation can create nanometer size pores in very thin membranes 10-20 nm thick, but to date ion beam sculpted nanopores have shown current blockades smaller than predicted from pores of this thickness. We use electron energy loss spectroscopy and energy filtered transmission electron microscopy to study ion beam sculpted nanopore geometry in detail and determine its effect on conductance blockades and I-V curves. Current blockades from pores thinned by chemical etching and ion beam sputtering will also be presented.

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