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Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Nanopores in suspended WS₂ membranes for DNA sequencing

GOPINATH DANDA, Department of Electrical and Systems Engineering, University of Pennsylvania, PAUL MASI H DAS, YUNG-CHIEN CHOU, JEROME MLACK, CARL NAYLOR, Department of Physics and Astronomy, University of Pennsylvania, NESTOR PEREA-LOPEZ, ZHONG LIN, Department of Physics, The Pennsylvania State University, LAURA BETH FULTON, Department of Mechanical Engineering, University of Pittsburgh, MAURICIO TERRONES, Department of Physics, The Pennsylvania State University, A. T. CHARLIE JOHNSON, MARIJA DRNDIC, Department of Physics and Astronomy, University of Pennsylvania — Recent advances in solid-state nanopore sensor systems for DNA detection and analysis have been supported by using increasingly thinner materials to the point of utilizing atomically thin two-dimensional materials such as graphene and MoS₂. However, these materials still have issues with pore wettability and signal-to-noise ratios displayed in DNA translocation measurements. Recently, the fabrication and operation of nanopores in MoS₂ have been demonstrated, but the wetting properties and signal-to-noise ratios of transition metal dichalcogenides are yet to be understood and further improved. Here we fabricate suspended WS₂ nanopore devices with sub-10 nm pore diameters using a novel nanomaterial transfer method and TEM nanosculpting to study and better understand nanopore wetting properties and performance in DNA translocation measurements.

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