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Graphene Nanopores for Single-Molecule DNA Sequencing AARON KUAN, Harvard School of Engineering and Applied Sciences, DAVID HOOGERHEIDE, Harvard Department of Physics, PING XIE, Oxford Nanopore Technologies, DANIEL BRANTON, Harvard Department of Molecular and Cellular Biology, JENE GOLOVCHENKO, Harvard Department of Physics and Harvard School of Engineering and Applied Sciences — We fabricate a nanopore in a suspended single-layer graphene membrane, which serves as a barrier between two aqueous DNA reservoirs. This nanopore device can detect the electrophoretic passage of single or double stranded DNA through transient ionic current blockades caused by DNA obstruction of the pore. Furthermore, a graphene pore, which has atomic thickness, should allow discrimination of different DNA base pairs by ionic current measurements alone. This base discrimination can become the basis of a single-molecule, ultrafast DNA sequencing scheme. We demonstrate the fabrication and evaluate the performance of these graphene nanopore devices.

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