Abstract Submitted
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Effects of Dephasing on DNA Sequencing via Transverse Electronic Transport[1] MATT KREMS, University of California, San Diego, YURIY PERSHIN, University of South Carolina, MICHAEL ZWOLAK, Los Alamos National Laboratory, MASSIMILIANO DI VENTRA, University of California, San Diego — We study theoretically the effects of dephasing on DNA sequencing in a nanopore via transverse electronic transport. To do this, we couple classical molecular dynamics simulations with transport calculations using scattering theory. Previous studies, which did not include dephasing, have shown that by measuring the transverse current of a particular base multiple times, one can get distributions of currents for each base that are distinguishable. We introduce a dephasing parameter into transport calculations to simulate the effects of the ions and other fluctuations. These effects lower the overall magnitude of the current, but have little effect on the current distributions themselves. The results of this work further implicate that distinguishing DNA bases via transverse electronic transport has potential as a sequencing tool.

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