

Abstract Submitted
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Up and down events in nanoparticle translocation through solid-state nanopores¹ MEHDI ZANJANI, REBECCA ENGELKE, JENNIFER LUKES, MARIJA DRNDIC, University of Pennsylvania — We study translocation of nanoparticles through solid-state nanopores. Normally, nanoparticle passage is expected to decrease ion current inside the nanopores, as in the case of typical Coulter counters. However, recent experiments have reported translocation events that show an increase in the ion current. We refer to such decrease and increase in ion current as *down events* and *up events* respectively. We use theoretical methods to study such events and to determine the conditions under which they happen. A transition nanopore diameter, d_t , is calculated from the theoretical model; up events are observed for nanopore diameters smaller than d_t , while for nanopore diameters larger than d_t down events will occur. We also discuss how a simple mechanism can be implemented to distinguish nanoparticles of different shapes and sizes based on such up and down translocation events.

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