Electronic Supplementary Material (ESI) for Nanoscale.

Supplementary Information

Silicon substrate effects on ionic current blockade in solid-state nanopores

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Supplementary Information includes:

1. Supplementary Figures (Figs. S1-S4)

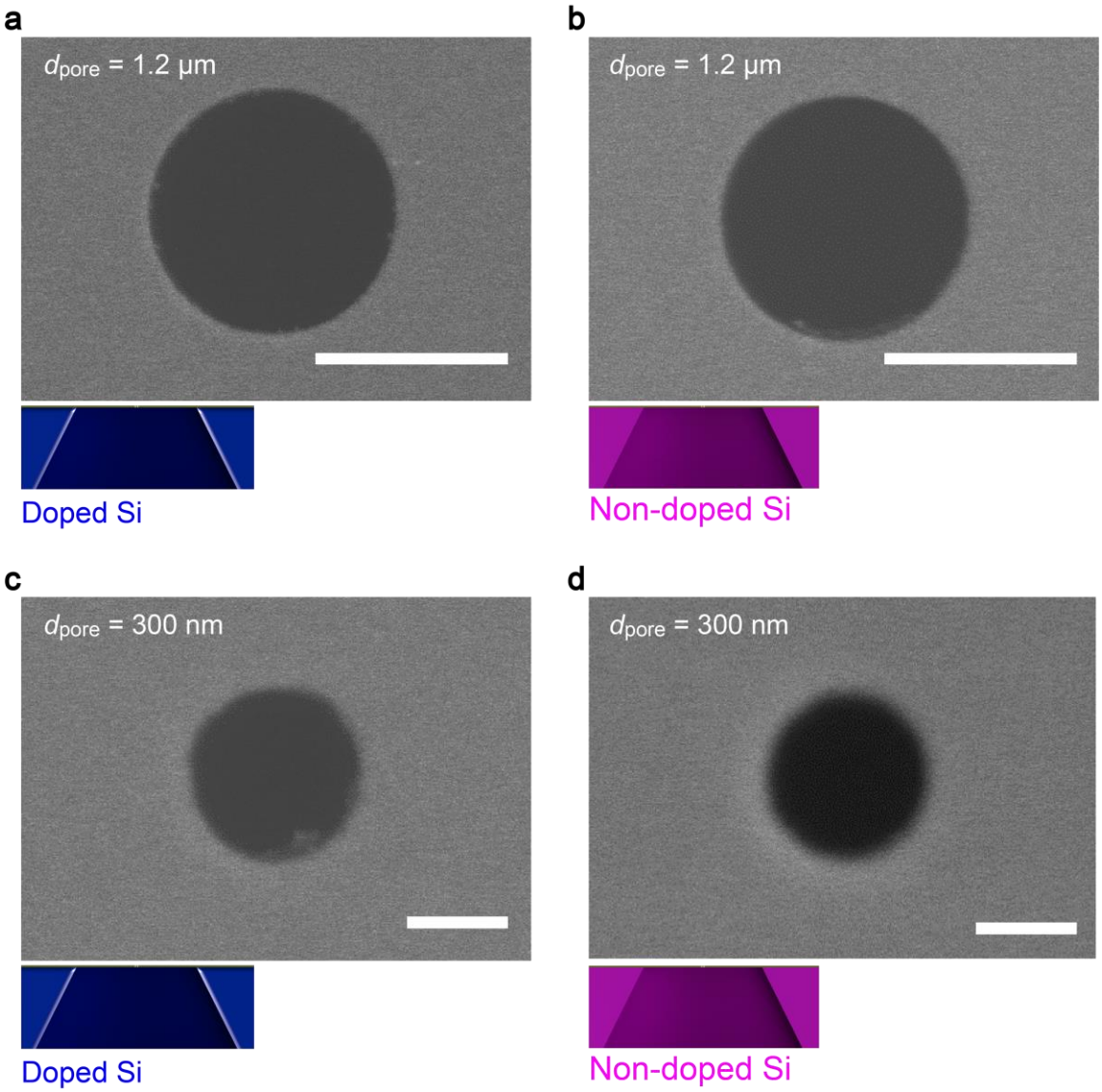

Figure S1. a-d, Scanning electron microscopy images of 1.2 µm-sized (a-b) and 300 nm-sized (c-d) pores in 50 nm-thick membranes supported on either doped (a,c) or non-doped Si (b,d). The difference in the channel diameter was less than 10 %. Scale bars denote 1 µm (a,b) and 200 nm (c,d).

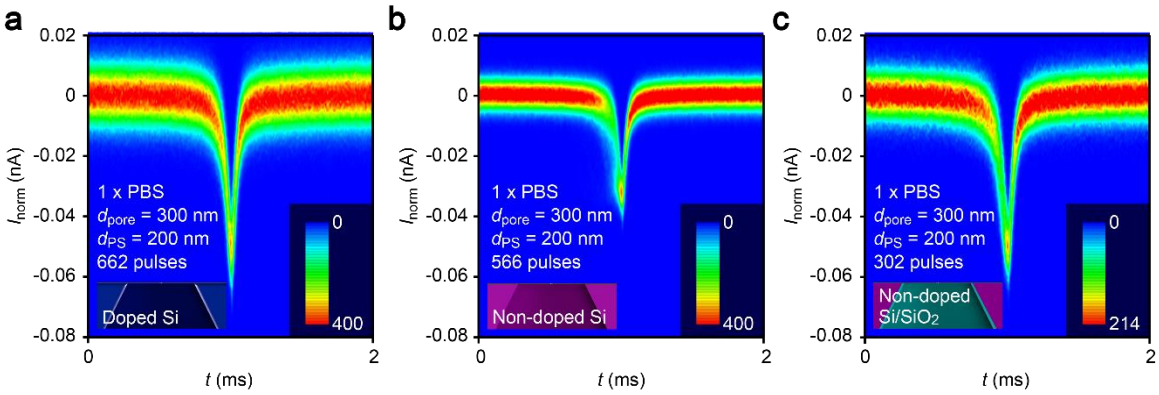

Figure S2. Normalized resistive pulses. **a-c,** Two-dimensional histograms of resistive pulses obtained with a 300 nm-sized and 50 nm-thick Si_3N_4 nanopore in 1 x PBS under 0.1 V. The ionic current I_{ion} is normalized by the open pore I_{open} as $I_{norm} = I_{ion} / I_{open}$.

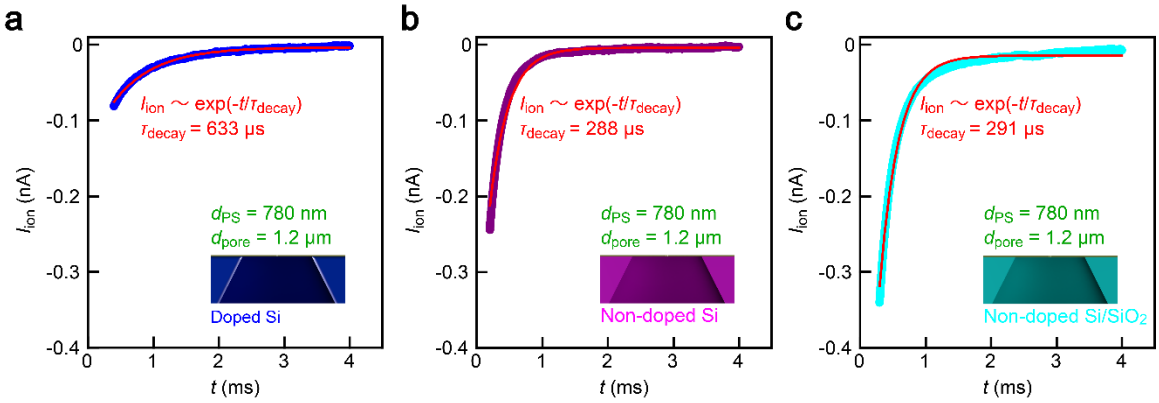

Figure S3. Ionic current response to electric field driven translocation of 780 nm-sized carboxylated polystyrene nanobeads in 0.1 x PBS through a 1.2 µm sized pore formed in a 50 nm thick Si_3N_4 membrane. **a-c,** Exponential decay of the ionic current at the pulse tails for the data obtained with the pore on doped Si (a), non-doped Si (b), and SiO_2-coated non-doped Si (c). Red curves are exponential fits.

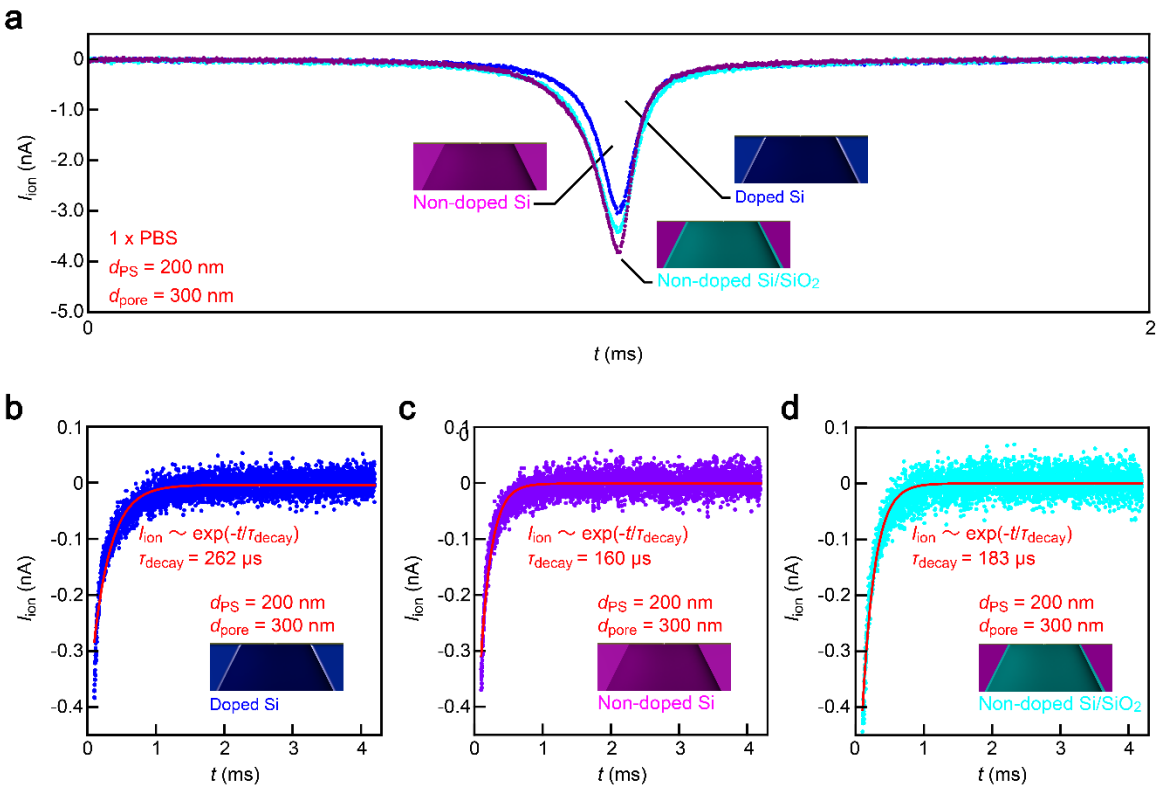

Figure S4. Ionic current response to ion blockade by fast-moving nanoparticles through a 300 nm sized pore formed in a 50 nm thick Si_3N_4 membrane. **a,** Average resistive pulses obtained for 200 nm-sized carboxylated polystyrene nanobeads in 0.1 x PBS with the micropore on doped Si (blue), non-doped Si (purple), and SiO_2-coated non-doped Si (skyblue). **b-d,** Exponential decay of the ionic current at the pulse tails for the data obtained with the pore on doped Si (b), non-doped Si (c), and SiO_2-coated non-doped Si (d). Red curves are exponential fits.