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Charged Nanoparticle Translocation through Solid-State Nanopores SANTOSHI NANDIVADA, RYAN ROLLINGS, NATHAN WALSH, JIALI LI, University of Arkansas at Fayetteville — Solid-state nanopores are widely used for detection of biomolecules and small particles by measuring the pore resistance change when the molecules or particles are electrophoretically driven through. Using the same principle, in this study we look at the translocation of different size, around 10 nm in diameter, negatively charged nanoparticles through nanopores fabricated by combining ion beams and electron beams. We measure the relationship between the current blockage signal caused by pore resistance change with nanoparticle size and nanopore geometry. We also estimate the magnitude and duration of current blockage signal theoretically by relating the change in the resistance of the nanopore to the geometry of the pore and the particle. Preliminary results obtained from experiment and numerical simulation using finite element analysis software (Multiphysisc,COMSOL Inc) will be presented.

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