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Ion Valence and Solution Temperature Effects on DNA Translocations in Solid-State Nanopores JAMES UPLINGER, Physics Department, University of Arkansas, DANIEL FOLOGEA, Physics Department, University of Arkansas, JIALI LI, Physics Department, University of Arkansas — Solid-state nanopore device provides a sensitive and robust environment for single DNA analysis. When a nanopore is the only partition between two reservoirs filled with an ionic solution and electrical conduction is established any DNA molecule translocation through the nanopore will partially block the open pore current. The current blockage and dwell time depends on both the external parameters, such as applied voltage, ionic strength and on characteristics of the DNA molecule itself, such as the charge and geometry. The properties of the molecule can be modulated by interactions with the ionic solution, and these will produce modifications of the current blockage and translocation time. Here we report on how the DNA translocation signature is modified when: (1) salts of varied valences are used and concentration of the surrounding solution changes; (2) the temperature of ionic solution changes. The mobility and diffusion coefficient of DNA molecule at above conditions are estimated.

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