

Abstract Submitted  
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**Noise and Ionic Conductivity in Glass Nanochannels**<sup>1</sup> BENJAMIN WIENER, Brown University, ALESSANDRO SIRIA, LYDÉRIC BOCQUET, Ecole Normale Supérieure, Paris, DEREK STEIN, Brown University — Ion transport in nanochannels is relevant to processes in biology and has technological applications like batteries, fuel cells, and water desalination. We report experimental studies of the ionic conductance and noise characteristics of pulled glass capillaries with openings on the order of 200 nanometers. We employed an AC measurement technique to probe very low frequency fluctuations in the conductivity and to test a theory attributing these to chemical fluctuations in the surface charge density of the glass. We also investigate Hooge’s empirical description of the noise power spectrum and its relationship to current rectification observed in nanochannels in the surface dominated “Dukhin” regime. Finally, we test the effects of anion and cation mobility on the direction and magnitude of the observed rectification.

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