Abstract Submitted for the MAR15 Meeting of The American Physical Society

Electrostatic effects of dielectric interfaces on confined electrolyte YUFEI JING, Applied Physics Program, Northwestern University, Evanston, IL 60208, VIKRAM JADHAO, Department of Physics & Astronomy, Johns Hopkins University, Baltimore, MD 21218, JOS W. ZWANIKKEN, MONICA OLVERA DE LA CRUZ, Department of Materials Science and Engineering, Northwestern University, Evanston, IL 60208 — The behavior of ions in liquids confined between interfaces characterized by different dielectric permittivities is crucial to many nanoscale assembly processes in synthetic and biological materials. The presence of multiple interfaces and associated dielectric heterogeneities often complicates computing the desired ionic distributions via simulations or theory. Electrostatic correlation effects in a system with electrolyte confined by two planar dielectric interfaces are systematically studied by Car-Parrinello molecular dynamics simulations and liquid state theory. Results for ionic density profiles for various electrolyte concentrations, stoichiometric ratios and dielectric contrasts are presented. We also investigate the interactions between two planar surfaces and effects of the dielectric interfaces on the double layer structure near the interfaces which lies at the heart of soft matter physics.

> Yufei Jing Applied Physics Program, Northwestern University, Evanston, IL 60208

Date submitted: 14 Nov 2014

Electronic form version 1.4