Abstract Submitted
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Nanoconfined water under electric field[1] ALENKA LUZAR, Department of Chemistry, Virginia Commonwealth University, D. BRATKO, C.D. DAUB — We study the effect of electric field on interfacial tension of nanoconfined water [1,2] using molecular simulations. Our analysis and simulations confirm that classical electrostriction characterizes usual electrowetting behavior in nanoscale hydrophobic channels and nanoporous materials [3]. We suggest a new mechanism to orient nanoparticles by an applied electric field even when the particles carry no charges or dipoles of their own. Coupling to the field can be accomplished trough solvent-mediated interaction between the electric field and a nanoparticle [4]. For nanoscale particles in water, we find the response to the applied field to be sufficiently fast to make this mechanism relevant for biological processes, design of novel nanostructures and sensors, and development of nanoengineering methods [5]. [1]C. D. Daub, D. Bratko, K. Leung and A. Luzar, J. Phys. Chem. C 111, 505 (2007). [2] D. Bratko, C. D. Daub, K. Leung and A. Luzar, J. Am. Chem. Soc. 129, 2504 (2007) [3] D. Bratko, C. D. Daub and A. Luzar, Phys. Chem. Chem. Phys. 10, 6807 (2008). [4] D. Bratko, C. D. Daub and A. Luzar, Faraday Discussions 141, 55 (2009). [5] C. D. Daub, D. Bratko, T. Ali and A. Luzar, Phys. Rev. Lett. 103, 207801 (2009).

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