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Interaction Between Two Nonuniform and Flexible Bio-Interfaces
Y.S. JHO, G. PARK, KAIST, C.S. CHANG, KAIST, NYU, M.W. KIM, KAIST, UCSB, P. PINCUS, UCSB, KAIST — One of fundamental interactions between charged bio-interfaces is the Coulomb interaction. The Coulomb interaction at nano-scale is different from that in a conventional scale due to proximity between charged particles. The attraction between two uniformly charged surfaces with same sign has been well known in a strongly coupled system. However surface charges in a real biological system are not uniformly distributed but rather discretely. We have found that the non-uniformity makes a stronger correlation of bulk counter ions to surface charges and induces stronger attractive pressure between two interfaces. Furthermore we have investigated the effect of the bio-interface flexibility on the pressure between two interfaces as a function of coupling parameter and distance for a large coupling parameter. Surface flexibility allows the surface ions to respond to counter ions. As a consequence, surface reforms to minimize total energy. Numerical simulations and theoretical analysis will be presented.

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