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**Efficient calculation of electrostatic interactions within dynamic dielectric environments** KIPTON BARROS, ERIK LUIJTEN, Northwestern University — Many biological and soft-matter systems exhibit self-assembly driven by electrostatic interactions. The resulting structures are often dense aggregates, and consequently the electrostatic interactions are significantly modified by dielectric inhomogeneities. This effect is typically ignored in computer simulations, as it greatly complicates the evaluation of energies and forces. Pioneering simulations have demonstrated that fixed dielectric inhomogeneities play a crucial role in biological processes such as water permeation through nanopores [Allen *et al.*, *J. Chem. Phys.* **119**, 3905 (2003)], but the effects of *dynamic* inhomogeneities remain relatively unexplored. We introduce a new method for the efficient calculation of electrostatic interactions within dynamic dielectric environments, and show preliminary simulation results for aqueous suspensions of synthetic colloids.

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