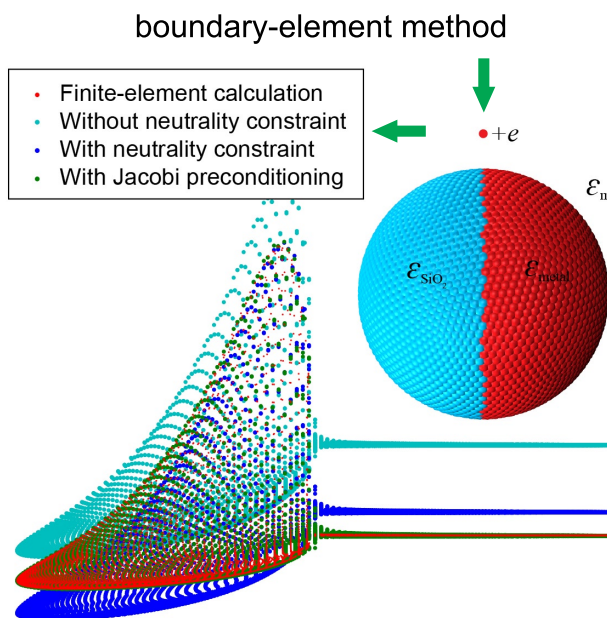


Dielectric Effects on the Ion Distribution Near a Janus Colloid, Soft Matter

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Caption: *With preconditioning techniques, the iterative dielectric solver can accurately compute the polarization of anisotropic particles with multiple dielectric contrasts, opening the possibility of the study of collective phenomena of dielectrically anisotropic particles.*

Scientific Achievement

We improved the *iterative dielectric solver* in combination with preconditioning techniques, making it possible to accurately and efficiently compute the polarization of dielectrically anisotropic building blocks.

Significance

Our work demonstrates how neutral particles can acquire a net electric dipole moment when placed in asymmetric salts—a common condition in physiological environments. Moreover, we showed that dielectric effects can substantially influence the electric double layer. On a general level, the techniques developed here will find application in a broad range of settings, improving predictive capabilities for biomaterials that self-assemble under influence of electrostatic driving forces.

Citation

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