

Abstract Submitted
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Test-charge theory for the planar electric double layer YORAM BURAK, Kavli Institute for Theoretical Physics, UCSB, DAVID ANDELMAN, School of Physics and Astronomy, Tel-Aviv University, HENRI ORLAND, Service de Physique Theorique, CE-Saclay — A new model for the ion distribution near a charged surface is presented, based on the response of the ions to the presence of a single test particle. Near an infinite planar surface this model produces the exact density profile, in the limits of weak and strong coupling, which correspond to zero and infinite values of the dimensionless coupling parameter; at intermediate values of the coupling parameter the model produces approximate density profiles that agree semi-quantitatively with recent Monte-Carlo simulations. The model also sheds light on the occurrence of a distance-dependent crossover from exponential to algebraic decay, even at very large values of the dimensionless coupling parameter.

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