Violation of the local electroneutrality condition in an inhomogeneous macroions solution

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A simple model for a macroions solution next to charged membrane is studied through a well-established integral equations theory, as a function of the macroions and membrane's charge. The macroions adsorption to the surface shows an atypical electrical double layer structure, which implies a violation of the local electroneutrality condition. A breakdown of the charge neutrality in confined, charged fluids, has been theoretically predicted in the past through an integral equation theory [1,2], and recently corroborated with a density functional theory, computer simulations [3], and experimentally [4]. In this presentation we show a charge neutrality breakdown, in *unconfined*, inhomogeneous fluids. Our results are in qualitative agreement with experimental results for Langmuir films of amphiphilic molecules with ionizable head groups [5].

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