Talk announcement

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The Nonlinear Poisson-Boltzmann Equation: well-posedness analysis

In this talk, we discuss the well-posedness of the problem as it appears in the state of the art. Then we discuss two different weak formulations for the PBE and show existence for one of them. As it turns out, these two weak formulations are equivalent for linear problems, but not for nonlinear, and both make sense to be considered. We continue by giving a complete proof for existence of a weak solution to both weak formulations, realized by minimizing a convex functional and showing that its minimizer satisfies one of the weak formulations. Contrary to the proofs in the state of the art, where a-priori L_∞ estimate on the weak solution of one of the weak formulations is shown, we show a-priori L^∞ estimate for the minimizer and using this estimate we are able to show that this minimizer is also a weak solution to the other weak formulation. Finally, two more weak formulations are discussed.