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A model of light front QCD zero mode and description of quark-antiquark bound states

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We consider a transition to the light front Hamiltonian from theories quantized on spacelike planes approaching to the light front. In this approach we preserve the dynamics of zero mode present in the theories near the light front. We make the limit transition differently for zero and nonzero modes. This leads to the appearance of some phenomenological parameter which can be used to describe vacuum effects. As an illustration of our scheme we consider the quark-antiquark bound states problem in 2+1 dimensions. We use the lattice gauge invariant regularization in transverse coordinate space and obtain the analog of 't Hooft equation. The numerical solution to this problem suggests that the spectrum of eigenvalues coincide with the spectrum of Airy differential equation.

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