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Theory of holographic models for linear Regge trajectories and its applications

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In our work we systematized various holographic models and relations between them. We started by constructing the most general theory that has a quadratic in fields, holographic 5D action violating the Poincaré invariance along the fifth coordinate, but which still produces linear Regge mass spectrum. This setup shows that a solvable Soft-Wall (SW) model with linear spectrum can have two z-dependent terms in the five-dimensional mass. However, as we demonstrated both these contributions can be reformulated as modifications of the AdS background.

After briefly reviewing our holographic framework outlined above, we discuss various phenomenological applications and properties of holographic models. In particular, we consider the vector two-point correlation function and pion form factor. In both cases we highlight the differences between the results produced by various SW models. In the case of pion form factor we compare our results with experimental data and show that the SW^{-} model is remarkably successful in describing both mass spectra and pion form factor data with the universal value of the intercept, while the SW^{+} model doesn't have this property. This is especially interesting considering that the SW^{-} model reproduces Vector Meson Dominance concept.

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