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Non-linear Regge trajectories with AdS/QCD

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In this work, we consider a non-quadratic dilaton $\Phi(z) = (\kappa z)^{2-\alpha}$ in the context of the static soft wall model to describe the mass spectrum of a wide range of vector mesons from the light up to the heavy sectors. The effect of this non-quadratic approach is translated into non-linear Regge trajectories with the generic form $M^2 = a(n+b)^\nu$. We apply this sort of fits for the isovector states of ω , ϕ , J/ψ , and Υ mesons and compare with the corresponding holographic duals. We also extend these ideas to the heavy-light sector by using the isovector set of parameters to extrapolate the proper values of κ and α through the average constituent mass \bar{m} for each mesonic specie considered. In the same direction, we address the description of possible non- $q\bar{q}$ candidates using \bar{m} as a holographic threshold, associated with the structure of the exotic state, to define the values of κ and α . We study the π_1 mesons in the light sector and the Z_c , Y , and Z_b mesons in the heavy sector as possible exotic vector states. Finally, the RMS error for describing these twenty-seven states with fifteen parameters (four values for κ and α respectively and seven values for \bar{m}) is 12.61%.

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