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Scalar spectrum in a graviton soft wall model

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In this study we present a unified phenomenological analysis of the scalar glueball and scalar meson spectra within an AdS/QCD framework in the bottom up approach. For this purpose we generalize the recently developed graviton soft-wall (GSW) model, which has shown an excellent agreement with the lattice QCD glueball spectrum, to a description of glueballs and mesons with a unique energy scale. In this scheme, dilatonic effects, are incorporated in the metric as a deformation of the AdS space. We apply the model also to the heavy meson spectra with success. We obtain quadratic mass equations for all scalar mesons while the glueballs satisfy an almost linear mass equation. Besides their spectra, we also discuss the mixing of scalar glueball and light scalar meson states within a unified framework: the GSW model. To this aim, the light-front holographic approach, which connects the mode functions of AdS/QCD to the light-front wave functions, is applied. This relation provides the probabilistic interpretation required to properly investigate the mixing conditions.

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