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Phenomenology of Dilaton in a Chiral Linear Sigma Model with Vector Mesons

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We present a two-flavour linear sigma model with global chiral symmetry and (axial-)vector mesons as well as an additional glueball degree of freedom. We study the structure of the well-established scalar resonances $f_0(1370)$ and $f_0(1500)$: by a fit to experimentally known decay widths we find that $f_0(1370)$ is predominantly a quark-antiquark state and $f_0(1500)$ is predominantly a glueball state. The overall phenomenology of these two resonances can be well described. Other assignments for our mixed quarkonium-glueball states are also tested, but turn out to be in worse agreement with the phenomenology. As a by-product of our analysis, the gluon condensate is determined.

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