Structure of scalar mesons $f_0(600)$, $a_0(980)$, $f_0(1370)$ and $a_0(1450)$

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We present a two-flavour linear sigma model with global chiral symmetry and vector and axial-vector mesons. We calculate pion-pion scattering lengths and the decay widths of scalar (and other) mesons.

An important question for meson vacuum phenomenology is the quark content of the scalar mesons $f_0(600)$ and $a_0(980)$. We investigate this question by assigning the quarkantiquark σ and a_0 states of our model with these physical mesons. We show via a comparison with experimental data that this scenario can describe all vacuum properties studied here except for the decay width of the $f_0(600)$, which turns out to be too small.

We also study the alternative assignment $f_0(1370)$ and $a_0(1450)$ for the scalar mesons. In this case the decay width of the isoscalar meson agrees with the experimental value. More details can be found in Ref. [1].

[1] D. Parganlija, F. Giacosa and D. H. Rischke, arXiv:1003.4934 [hep-ph].

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