

Decay processes of $\phi(2170)$ to kaonic resonances

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We have recently studied the strong decays of $\phi(2170)$ to final states involving the kaonic resonances $K(1460)$, $K_1(1270)$ and $K_1(1400)$, on which experimental data have been extracted by the BESIII Collaboration. The formalism developed is based on interpreting $\phi(2170)$ and $K(1460)$ as states arising from three-hadron dynamics. For $K_1(1270)$ and $K_1(1400)$ we investigate different descriptions, such as a mixture of states belonging to the nonet of axial resonances, or the former one as a state originating from the vector- pseudoscalar dynamics. The ratios among the partial widths of $K^+(1460)K^-$, $K_1^+(1400)K^-$ and $K_1^+(1270)K^-$ obtained are compatible with the experimental results, reinforcing the three-body nature of $\phi(2170)$. Within our formalism, we can also explain the suppressed decay of $\phi(2170)$ to $K^*(892)K^*(892)$, as found by the BESIII Collaboration. Furthermore, our results can be useful in clarifying the properties of $K(1460)$, $K_1(1270)$ and $K_1(1400)$ when higher statistics data would be available.

Collaboration

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