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A triangle singularity in the $J/\psi \rightarrow \phi \pi^+ a_0^-(\pi^+ \eta)$ decay

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We study the $J/\psi \rightarrow \phi \pi^+ a_0^-(\pi^+ \eta)$ decay, evaluating the double mass distribution in terms of the $\pi^+ \eta$ and $\pi^+ a_0^-$ invariant masses. We show that the $\pi^+ \eta$ mass distribution exhibits the typical cusp structure of the $a_0(980)$ seen in recent high statistics experiments, and the $\pi^+ a_0^-$ spectrum shows clearly a peak around $M_{\text{inv}}(\pi^+ a_0^-) = 1420$ MeV, corresponding to a triangle singularity. When integrating over the two invariant masses we find a branching ratio for this decay of the order of 10^{-5} , which is easily accessible in present laboratories.

session

D. Hadron Decays

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