

## 2 - 7 Theoretical Research on the Isovector Partner of $f_0(1710)$ in $D_s^+$ Decays\*

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In 2022, the BESIII collaboration measured  $D_s^+ \rightarrow \pi^+ K_S^0 K_S^0$  decay<sup>[1]</sup> and found a peak near 1.7 GeV in the  $K_S^0 K_S^0$  invariant mass distribution. It is abnormally different from the peak of  $D_s^+ \rightarrow K^+ K^- \pi^+$  decay in another work of BESIII<sup>[2]</sup>. This indicates an isospin companion of the scalar meson  $f_0(1710)$ , named  $a_0(1710)$ . In this case, we would find the charged  $a_0(1710)^+$  in  $D_s^+ \rightarrow \pi^0 K^+ K_S^0$  decay (Fig. 1). Recently, the BESIII collaboration has measured the decay of  $D_s^+ \rightarrow \pi^0 K^+ K_S^0$  and reported the observation of the scalar meson  $a_0(1710)$  in the  $K^+ K_S^0$  invariant mass distribution<sup>[3]</sup>. Through the theoretical study, we find our results are in well agreement with the experimental data<sup>[4,5]</sup>. Our results support the molecular explanation of  $a_0(1710)$  and  $f_0(1710)$  and also provide further theoretical support for the BESIII experiment.

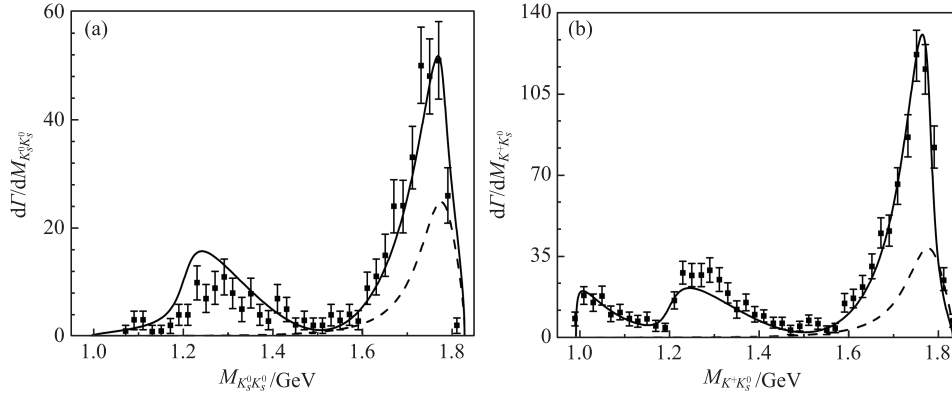


Fig. 1 (a) and (b) are the  $K_S^0 K_S^0$  and  $K^+ K_S^0$  invariant mass distribution of decays  $D_s^+ \rightarrow \pi^+ K_S^0 K_S^0$  and  $D_s^+ \rightarrow \pi^0 K^+ K_S^0$ , respectively. The experimental data are taken from Refs. [1] and [3] respectively, and each event bin width is 20 MeV. The solid curve is the total result while the dashed curve is the contribution from  $a_0(1710)$ .

### References

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