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The $D^+ \rightarrow \bar{K}^0 \pi^+ \eta$ reaction and $a_0(980)$

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The $D^+ \rightarrow K_s^0 \pi^+ \eta$ reaction was recently measured by the BESIII collaboration [1]. The reaction is actually $D^+ \rightarrow \bar{K}^0 \pi^+ \eta$, with the \bar{K}^0 observed as a K_s^0 state.

We study the $D^+ \rightarrow \bar{K}^0 \pi^+ \eta$ reaction, where the $a_0(980)$ excitation plays a dominant role. We consider mechanisms of external and internal emission at the quark level, hadronize the $q\bar{q}$ components into two mesons, and allow these mesons to undergo final-state interaction, where the $a_0(980)$ state is dynamically generated. While the production of $a_0(980)$ is the dominant term, we also find other terms in the reaction that interfere with this production mode. Through interference with it, they lead to a shape of the $a_0(980)$ significantly different from the one observed in other experiments, with an apparently much larger width. I will give a presentation based on Ref. [2] and also discuss the $D^0 \rightarrow K^- \pi^+ \eta$ reaction by changing a $\bar{d} \rightarrow \bar{u}$ quark in Ref. [3].

[1] M.~Ablikim et al. [BESIII], arXiv:2309.05760 [hep-ex].

[2] N. Ikeno, J. M. Dias, W. H. Liang and E. Oset, arXiv:2402.04073 [hep-ph].

[3] G. Toledo, N. Ikeno and E. Oset, Eur. Phys. J. C81, 268 (2021).

session

D. Hadron Decays

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