## Phenomenology 2020 Symposium



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## Revisiting $X(3872) \rightarrow D^0 \bar{D}^0 \pi^0$ in XEFT

Monday 4 May 2020 17:30 (15 minutes)

The calculation of the decay  $X(3872) \rightarrow D^0 \bar{D}^0 \pi^0$  in

effective field theory is revisited to include final state  $\pi^0 D^0$ ,

 $\pi^0\bar{D}^0$  and  $D^0\bar{D}^0$  rescattering diagrams. These introduce significant

uncertainty into the prediction for the partial width as a function of

the binding energy. The differential distribution in the pion energy is

also studied for the first time. The normalization of the distribution is again quite uncertain due to higher order effects but the shape of

the distribution is unaffected by higher order corrections. Furthermore

the shape of the distribution and the location of the peak are sensitive to the binding energy of X(3872). The shape is strongly impacted by the presence of virtual  $D^{*0}$  graphs which highlights the molecular nature of the X(3872).

Measurement of the pion energy distribution in the decay  $X(3872) \rightarrow D^0 \bar{D}^0 \pi^0$  can reveal interesting information about the binding

nature of the X(3872).

## Summary

Exotic States, Heavy Mesons, EFT

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