

## Probing $Y(4260)$ as the $D_1\bar{D} + c.c.$ hadronic molecule state in $e^+e^-$ annihilations

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During the past decade, a large number of the so-called  $X$ ,  $Y$ ,  $Z$  states have been observed in the heavy flavor sector, as have become candidates for exotic hadrons which may contain more complicated quark-gluon structures than the conventional quark model picture. Among all those exotic candidates, the  $Y(4260)$  is undoubtedly one of the most mysterious states and has initiated a lot of experimental and theoretical studies since its observation by BaBar Collaboration in the  $J/\psi\pi\pi$  channel in 2005. I will discuss our recent works in probing  $Y(4260)$  as the  $D_1\bar{D} + c.c.$  hadronic molecule state using the non-relativistic effective field theory. This study shows that the  $Y(4260)$  contains predominantly a  $\bar{D}D_1 + c.c.$  molecular component and its decays into the  $\bar{D}D^*\pi + c.c.$  channel should have a nontrivial lineshape. It also provides a natural explanation for the production of  $Y(4260)$  in  $e^+e^-$  annihilations in the same framework and allows us to predict the  $Y(4260)$  leptonic decay width of which the upper limit is about 500 eV.

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