

## Reanalysis of the $e^+e^- \rightarrow (D^*\bar{D}^*)^\pm\pi^\mp$ reaction and the claim for the $Z_c(4025)$ resonance.

*Sunday, 27 October 2013 17:20 (20 minutes)*

In this paper we study the reaction  $e^+e^- \rightarrow (D^*\bar{D}^*)^\pm\pi^\mp$  in which the BESIII collaboration has claimed the existence of a  $1^+$  resonance, named  $Z_c(4025)$ , in the  $D^*\bar{D}^*$  invariant mass spectrum with a mass around 4026 MeV and width close to 26 MeV. We determine the  $D^*\bar{D}^*$  invariant mass distribution and find that although the explanation considered by the BESIII collaboration is plausible, there are others which are equally possible, like a  $2^+$  resonance or a bound state. Even more, we find that the data can be explained without the existence of a resonance/bound state. In view of the different possible interpretations found for the BESIII data, we try to devise a strategy which could help in identifying the origin of the signal reported by the BESIII collaboration. For this, we study the dependence of the  $D^*\bar{D}^*$  spectrum considering the different options as a function of the total center of mass energy. We arrive to the conclusion that increasing the center of mass energy from 4.26 GeV to 4.6 GeV can be useful to distinguish between a resonance, a bound state or just a pure background as being responsible for the signal found. This information should be useful for future experiments.

**Primary author:** Dr MARTINEZ TORRES, ALBERTO (IF-UNIVERSIDADE DE SAO PAULO)

**Presenter:** Dr MARTINEZ TORRES, ALBERTO (IF-UNIVERSIDADE DE SAO PAULO)

**Track Classification:** Parellel A