

Theory Summary

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In this presentation I will present my take aways of this meeting

- The presentation does not call for completeness
- I focus on topics, not talks
- The presentation is based on my subjective point of view

Talks and discussions revealed that the crucial quantities to understand the role of molecules in the spectrum are

→ **the effective range** (from lattice or experiment)

▷ $r > 0 \implies$ **hadronic molecule**

▷ $r < 0 \implies$ **Compact component**
(or coupled channel effect?)

Unitarity fixes prod. amp. **E-dep. only up to polynomial!**

→ **lineshapes**

What is needed:

→ Combined analysis of various channels

For $\chi_{c1}(3872)$: $\pi\pi J/\psi$, $D^0\bar{D}^{*0}$, $\pi\chi_{cJ}$

→ High resolution analyses (PANDA?)

Breit Wigner analyses are to be taken with care:

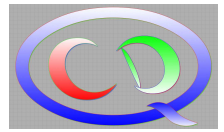
- violate unitarity
- parameters reaction dependent
 - ⇒ parameters from one reaction to another questionable
 - ⇒ even too many states, e.g. only $\pi_1(1400)$; no $\pi_1(1600)$
(JPAC confirmed by Bochum group)

What is needed in formalisms consistent with

- unitarity
- analyticity
- chiral symmetry
- low energy phase shifts (non-trivial for s-waves)
- Role of triangle singul. (Discussion on Di-baryons)

Applies also to analysis of lattice data!

$$(g - 2)_\mu$$



On a very good path to accomplish the program

Currently most pressing issue

⇒ Lattice systematics needs to be understood

It is my understanding that there is not much freedom on phenomenological/dispersion theoretical side of the calculation