Search for structures near J/ψ + Υ mass threshold

Talking Slides

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CLHCP, Nov 25, 2021

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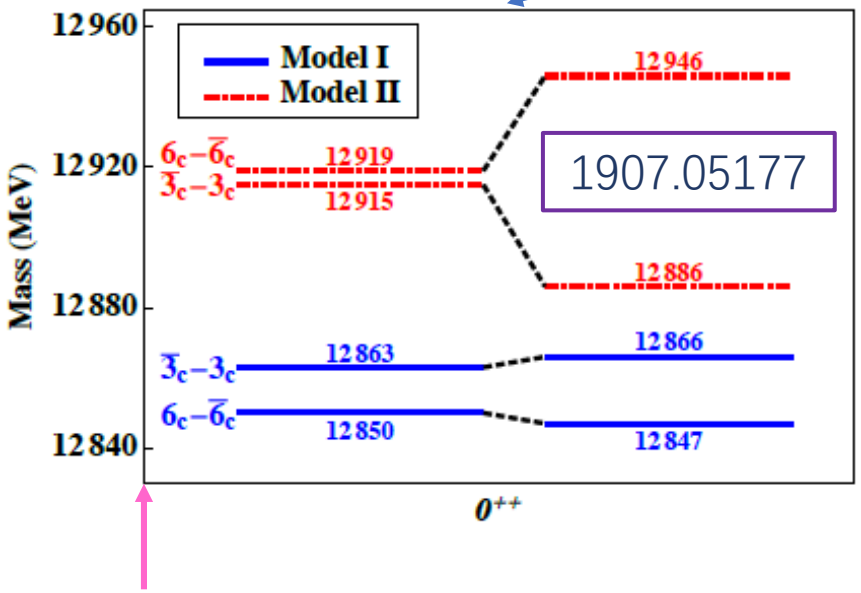
♦ Motivation

- Theories predicted $cc\bar{c}\bar{c}$, $bb\bar{b}\bar{b}$, $bc\bar{b}\bar{c}$ structure(s): mass above/below threshold
- New developments: resonance vs. CUSP (dynamical peak)



m(J/ψ) + m(ϒ) = 12.557 GeV

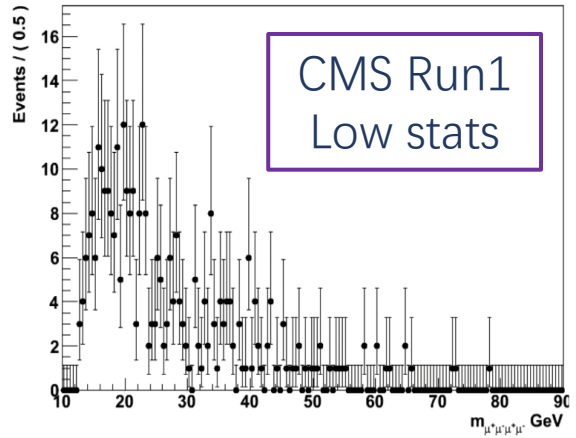
Rescattering channels	$m_{J/\psi\Upsilon(1S)}$ (MeV)
$\psi\Upsilon$	12648
$\chi_{c0}\eta_b$	12903
$\chi_{c1}\eta_b$	12948
$\eta_c\chi_{b0}$	12952
$\eta_c\chi_{b1}$	12968
$\eta_c\chi_{b2}$	12981
$\chi_{c2}\eta_b$	12990
$h_c\Upsilon$	12990
ψh_b	12998
$\chi_{c0}\chi_{b0}$	13293
$\chi_{c0}\chi_{b1}$	13324
$\chi_{c0}\chi_{b2}$	13343
$\chi_{c1}\chi_{b0}$	13378
$\chi_{c1}\chi_{b1}$	13407
$\chi_{c2}\chi_{b0}$	13425
$\chi_{c1}\chi_{b2}$	13426
$\chi_{c2}\chi_{b1}$	13454
$\chi_{c2}\chi_{b2}$	13473

2012.03281

Experiment

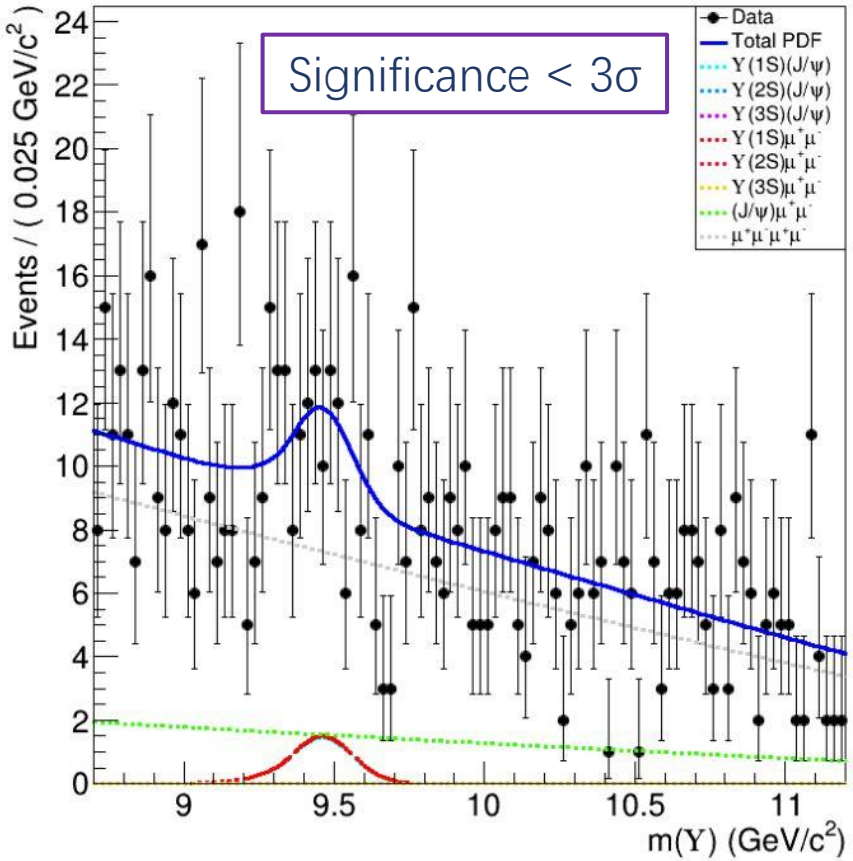
Y(1S)-J/ψ Mass

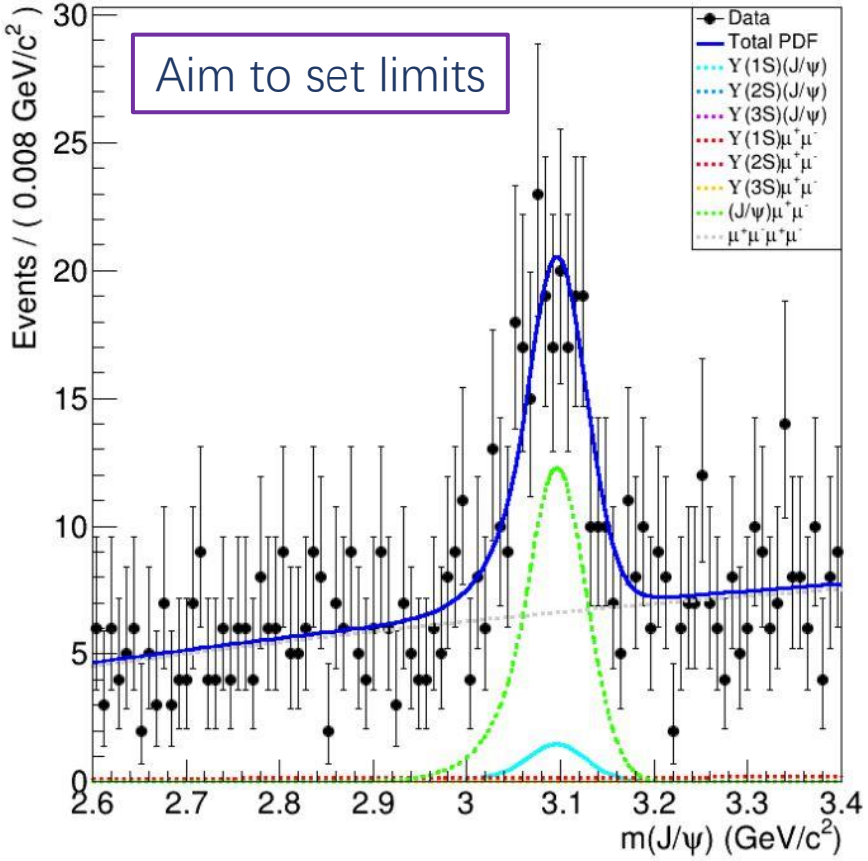
- M(ϒJ/ψ) with background looks smooth, difficult to look for resonance due high background under ϒ and low statistics.
- Maybe x-section measurement ?



♦ Final event selection

■ Υ(1S) + J/ψ 2D fit (with dimuon EBE & mass constraint vtx_{prob} cuts not applied)





Yields from fit:

N(Υ(1S) J/ψ) = 16±9;

N(Υ(1S) μμ) = 16±12;

N(μμ J/ψ) = 131±16;

N(μμ μμ) = 620±27;

♦ Summary

- No excess is found in this $J/\psi + \Upsilon$ channel.
- Aim to set upper limits on *Cross Section* × *Branching Ratio* [fb^{-1}]

- Thank you very much!

The End