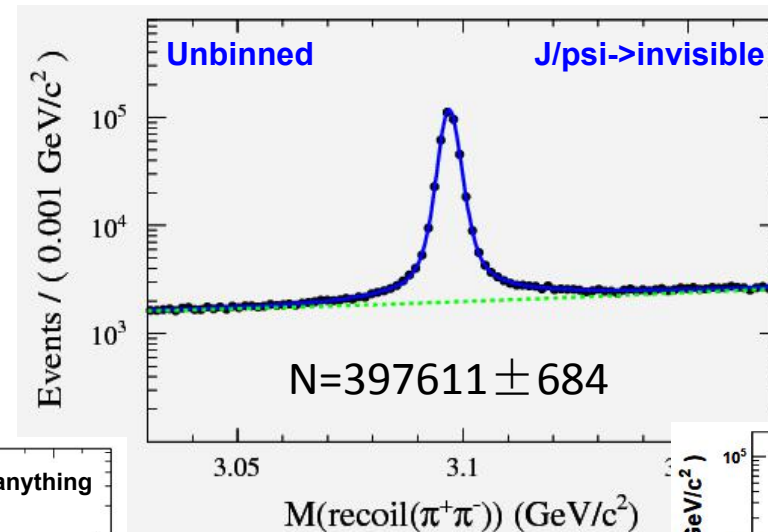
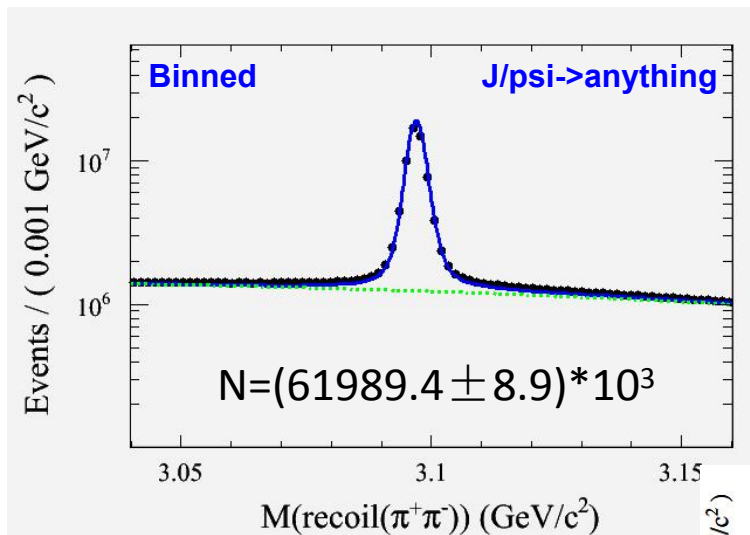


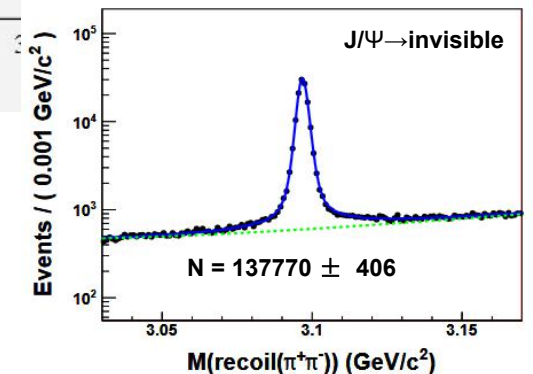
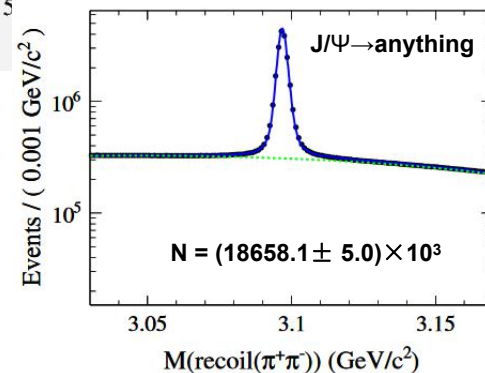
Fit results for J/psi->anything & invisible

- run J/psi->ee to get signal shape
- fit to J/psi->anything and J/psi->invisible to get field

2012



2009



Expectation of peaking background events

- use ϵ_{2B} , ϵ_{trig} the same as 2009
- MC Topology J/psi->others: 16163 (given by Qian)

Channel	$B_{2B}(\%)$ checked	$\epsilon_{2B}(\%)(09)$ need update	$\epsilon_{trig}(\%)$	Event number(12)	Event number(09)	Event number 12/09
J/ Ψ -> $\mu^+\mu^-$	5.961 ± 0.033	5.93 ± 0.02	99.4 ± 0.1	217810 ± 1429	65558 ± 1388	3.32
J/ Ψ -> e^+e^-	5.971 ± 0.032	5.93 ± 0.02	99.4 ± 0.1	218175 ± 1399	65668 ± 1405	3.32
J/ Ψ -> $nnbar$	0.209 ± 0.016	6.09 ± 0.02	99.4 ± 0.1	7843 ± 7843	2361 ± 997	3.32
J/ Ψ -> $ppbar$	0.2020 ± 0.0029	2.54 ± 0.02	99.4 ± 0.1	3161 ± 52	999 ± 28	3.16
Total (total/anything)				446989 (0.72%)	134586 ± 2919 (0.72%)	3.32
N_{others} (others/peaking)				16163 (0.038)	3877 (0.029)	4.17
$N_{invisible}$				397611 ± 684	137770	2.89

$\Psi(2S)$ data 12/09:
341/106=3.22

$$\begin{aligned}
 & N(J/\Psi \rightarrow invisible) \\
 &= N_{invisible} - N_{peaking} - N_{others} \times \epsilon_{trig} \\
 &= -65444 (-670 \text{ in } 2009)
 \end{aligned}$$

nsig = 396332 ± 686
(given by Qian)

Memo v1.1 update

- update memo v1.1 to new module
 - logo, referee committee and DocDB&Hypernews link
 - no changelog in memo
 - add contents link

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old

January 5, 2018 – 18:12

1 Contents

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new

1 Search for invisible decays of the J/ψ

2 resonance

3 Qian Chen¹; Suyu Xiao² † Ryuta Kiuchi², Xin Shi², Dayong Wang¹

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BESIII Analysis Memo (BAM-00194): Version 1.1

November 30, 2017

5 Abstract

6 By analyzing a data sample of $(106.41 \pm 0.86) \times 10^6$ $\psi(2S)$ events collected

7 with the BESIII detector operating at the BEPCII collider, we present results of a

8 search for the invisible decay of the J/ψ via the $\psi(2S) \rightarrow \pi^+\pi^-J/\psi$ transition. No

9 significant excess of signal events above background is observed, and an upper limit

10 at a 90% confidence level is deduced to be 5.1×10^{-3} for the ratio $\frac{B(J/\psi \rightarrow \text{invisible})}{B(J/\psi \rightarrow \mu^+\mu^-)}$.

11 Using the PDG value of $B(J/\psi \rightarrow \mu^+\mu^-)$, the upper limit of $B(J/\psi \rightarrow \text{invisible})$ at

12 90% C.L. could also be lowered substantially compared to the current PDG value.

old



Memo version 1.1

BESIII Analysis Memo

DocDB-426

BAM-194

January 8, 2018

1 Search for invisible decays of the J/ψ resonance

2 Qian Chen^a, Suyu Xiao^b, and Ryuta Kiuchi^b, Xin Shi^b, Dayong Wang^a, Chi Zhang^c,

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7 Internal Referee Committee

8 Ref1 Fang Liu (Chair)^d, Ref2 Isabella Garzia^e, and Ref3 Xiaorong Zhou^f

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10 ^eFerrara

11 ^fUniversity of Science and Technology of China

12 DocDB : <http://docbes3.ihep.ac.cn/cgi-bin/DocDB/ShowDocument?docid=426>

13 Hypernews : <http://hnbes3.ihep.ac.cn/HyperNews/get/paper194.html>

14 Abstract

15 By analyzing a data sample of $(106.41 \pm 0.86) \times 10^6$ $\psi(3686)$ events collected with the

16 BESIII detector operating at the BEPCII collider, we present results of a search for the

17 invisible decay of the J/ψ via the $\psi(3686) \rightarrow \pi^+\pi^-J/\psi$ transition. No significant excess

18 of signal events above background is observed, and an upper limit at a 90% confidence

19 level is deduced to be 5.1×10^{-3} for the ratio $\frac{B(J/\psi \rightarrow \text{invisible})}{B(J/\psi \rightarrow \mu^+\mu^-)}$. Using the PDG value of

20 $B(J/\psi \rightarrow \mu^+\mu^-)$, the upper limit of $B(J/\psi \rightarrow \text{invisible})$ at 90% C.L. could also be lowered

21 substantially compared to the current PDG value.

new