NODE=M181

$\psi(4360)$

$I^G(J^{PC}) = 0^-(1^{--})$

also known as $Y(4360)$; was $X(4360)$

See the reviews on the "Spectroscopy of Mesons Containing two Heavy Quarks' and on "Heavy Non-qqbar Mesons."

NODE=M181

ψ(4360) MASS

NODE=M181M

NODE=M181M

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
4373 ± 7 OUR AVERAGE		Error includes scale factor of 2.3. See the ideogram below.			
[4374 ± 7 MeV OUR 2025 AVERAGE Scale factor = 2.4]					
$4327.4^{+20.1+10.7}_{-18.8-\ 9.3}$		[1] ABLIKIM	25B	BES3	$e^+e^- \to \pi^+\pi^- h_c(1P)$
4386 ±13 ±17		[2] ABLIKIM	24T	BES3	$e^+e^- \to \eta J/\psi$
4371.6± 2.5± 9.2		[3] ABLIKIM	22AL	BES3	$e^+e^- \to \pi^+\pi^- D^+D^-$
4298 ±12 ±26		[4] ABLIKIM	22AM	BES3	$e^+e^- \to \pi^+\pi^- J/\psi$
4390.3± 6.0± 0.7		[5] ABLIKIM	21AJ	BES3	$e^+e^- \to \pi^+\pi^- \psi(2S)$
4371.7± 7.5± 1.8		[6] ABLIKIM	21AK	BES3	$e^+e^- \to \gamma\chi_{c2} \to \gamma\gamma J/\psi$
$4391.5^{+\ 6.3}_{-\ 6.8}\pm 1.0$		ABLIKIM	17G	BES3	$e^+e^- \to \pi^+\pi^- h_c$
4347 ± 6 ± 3	279	[7] WANG	15A	BELL	$10.58\ e^+e^- \to \gamma\pi^+\pi^-\psi(2S)$
4340 ±16 ± 9	37	[8] LEES	14F	BABR	$10.58\ e^+e^- \to \gamma\pi^+\pi^-\psi(2S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
4406.9±17.2± 4.5		[9] ABLIKIM	22R	BES3	$e^+e^- \to \pi^+\pi^-\chi_{c1}\gamma$
4382.0±13.3± 1.7		[10] ABLIKIM	20O	BES3	$e^+e^- \to \eta J/\psi$
4320.0±10.4± 7.0		[11] ABLIKIM	17B	BES3	$e^+e^- \to \pi^+\pi^- J/\psi$
4383.8± 4.2± 0.8		[12] ABLIKIM	17V	BES3	$e^+e^- \to \pi^+\pi^-\psi(2S)$
4383.7± 2.9± 6.2		[13] ZHANG	17B	RVUE	$e^+e^- \to \pi^+\pi^-\psi(2S)$
4386.4± 2.1± 6.4		[14] ZHANG	17C	RVUE	$e^+e^- \to \pi^+\pi^- J/\psi$ or $\psi(2S)$
$4355\ ^{+\ 9}_{-10}\pm 9$	74	[15] LIU	08H	RVUE	$10.58\ e^+e^- \to \gamma\pi^+\pi^-\psi(2S)$
4324 ±24		[16] AUBERT	07S	BABR	$10.58\ e^+e^- \to \gamma\pi^+\pi^-\psi(2S)$
4361 ± 9 ± 9	47	[8] WANG	07D	BELL	$10.58\ e^+e^- \to \gamma\pi^+\pi^-\psi(2S)$

NEW

[1] Using three coherent Breit-Wigner functions between 4.009 and 4.950 GeV. NODE=M181M;LINKAGE=O

[2] From a three-resonance fit to the Born cross section in the range $\sqrt{s}$ = 3.808–4.951 GeV. Supersedes ABLIKIM 20O. NODE=M181M;LINKAGE=N

[3] From a fit to the cross section for $e^+e^- \to D^+D^-\pi^+\pi^-$ in the range $\sqrt{s}$ = 4.190–4.946 GeV. NODE=M181M;LINKAGE=M

[4] From a three-resonance fit to the Born cross section in the range $\sqrt{s}$ = 3.7730–4.7008 GeV. Parameters depend on the existence or non-existence of a state near 4.5 GeV. NODE=M181M;LINKAGE=L

[5] From a three-resonance fit to the Born cross section in the range $\sqrt{s}$ = 4.008–4.698 GeV. NODE=M181M;LINKAGE=H

[6] From a five-resonance fit to the cross section for $e^+e^- \to \gamma\gamma J/\psi \to \gamma\gamma\ell^+\ell^-$. NODE=M181M;LINKAGE=G

[7] From a two-resonance fit. Supersedes WANG 07D. NODE=M181M;LINKAGE=A

[8] From a two-resonance fit. NODE=M181M;LINKAGE=WA

[9] From a fit to the $e^+e^- \to \pi^+\pi^-\psi(3823)$ cross section between 4.23 and 4.70 GeV with two coherent Breit-Wigner resonances. The data is also consistent with a single peak with mass 4417.5 ± 26.2 ± 3.5 MeV and width 245 ± 48 ± 13 MeV. NODE=M181M;LINKAGE=J

[10] From a fit of the measured cross section in the range $\sqrt{s}$ = 3.808–4.600 GeV. NODE=M181M;LINKAGE=BA

[11] From a three-resonance fit. Superseded by ABLIKIM 22AM. NODE=M181M;LINKAGE=K

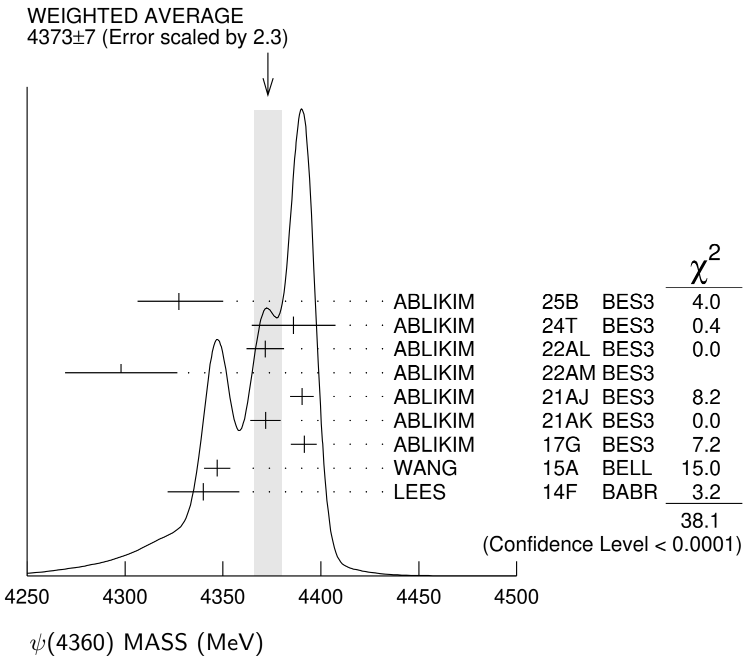
[12] From a fit to the cross section for $e^+e^- \to \pi^+\pi^-\psi(2S) \to 2(\pi^+\pi^-)\ell^+\ell^-$ obtained from 16 center-of-mass energies between 4.008 and 4.600 GeV and comprising 5.1 fb^{-1}. Superseded by ABLIKIM 21AJ. NODE=M181M;LINKAGE=C

[13] From a three-resonance fit. NODE=M181M;LINKAGE=E

[14] From a combined fit of BELLE, BABAR and BES3 $e^+e^- \to \pi^+\pi^- J/\psi$ and $e^+e^- \to \pi^+\pi^-\psi(2S)$ data. NODE=M181M;LINKAGE=D

[15] From a combined fit of AUBERT 07S and WANG 07D data with two resonances. NODE=M181M;LINKAGE=LI

[16] From a single-resonance fit. Systematic errors not estimated. NODE=M181M;LINKAGE=AU



$\psi(4360)$ WIDTH

NODE=M181W

NODE=M181W
NEW

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
124 ±13 OUR AVERAGE Error includes scale factor of 2.4. See the ideogram below. [120 ± 12 MeV OUR 2025 AVERAGE Scale factor = 2.1]				
$244.1^{+34.0}_{-27.1}{}^{+24.2}_{-18.3}$		[1] ABLIKIM	25B BES3	$e^+e^- \to \pi^+\pi^- h_c(1P)$
177 ±32 ±13		[2] ABLIKIM	24T BES3	$e^+e^- \to \eta J/\psi$
167 ± 4 ±29		[3] ABLIKIM	22AL BES3	$e^+e^- \to \pi^+\pi^- D^+ D^-$
127 ±17 ±10		[4] ABLIKIM	22AM BES3	$e^+e^- \to \pi^+\pi^- J/\psi$
143.3±10.0± 0.5		[5] ABLIKIM	21AJ BES3	$e^+e^- \to \pi^+\pi^- \psi(2S)$
51.1±17.6± 1.9		[6] ABLIKIM	21AK BES3	$e^+e^- \to \gamma\chi_{c2} \to \gamma\gamma J/\psi$
$139.5^{+16.2}_{-20.6}\pm 0.6$		ABLIKIM	17G BES3	$e^+e^- \to \pi^+\pi^- h_c$
103 ± 9 ± 5	279	[7] WANG	15A BELL	10.58 $e^+e^- \to \gamma\pi^+\pi^-\psi(2S)$
94 ±32 ±13	37	[8] LEES	14F BABR	10.58 $e^+e^- \to \gamma\pi^+\pi^-\psi(2S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
128.1±37.2± 2.3		[9] ABLIKIM	22R BES3	$e^+e^- \to \pi^+\pi^-\chi_{c1}\gamma$
135.8±60.8±22.5		[10] ABLIKIM	20O BES3	$e^+e^- \to \eta J/\psi$
$101.4^{+25.3}_{-19.7}\pm 10.2$		[11] ABLIKIM	17B BES3	$e^+e^- \to \pi^+\pi^- J/\psi$
84.2±12.5± 2.1		[12] ABLIKIM	17V BES3	$e^+e^- \to \pi^+\pi^-\psi(2S)$
94.2± 7.3± 2.0		[13] ZHANG	17B RVUE	$e^+e^- \to \pi^+\pi^-\psi(2S)$
96.0± 6.7± 2.7		[14] ZHANG	17C RVUE	$e^+e^- \to \pi^+\pi^- J/\psi$ or $\psi(2S)$
$103\ ^{+17}_{-15}\pm 11$	74	[15] LIU	08H RVUE	10.58 $e^+e^- \to \gamma\pi^+\pi^-\psi(2S)$
172 ±33		[16] AUBERT	07S BABR	10.58 $e^+e^- \to \gamma\pi^+\pi^-\psi(2S)$
74 ±15 ±10	47	[8] WANG	07D BELL	10.58 $e^+e^- \to \gamma\pi^+\pi^-\psi(2S)$

[1] Using three coherent Breit-Wigner functions between 4.009 and 4.950 GeV. NODE=M181W;LINKAGE=N

[2] From a three-resonance fit to the Born cross section in the range $\sqrt{s} = 3.808$–4.951 GeV. Supersedes ABLIKIM 20O. NODE=M181W;LINKAGE=M

[3] From a fit to the cross section for $e^+e^- \to D^+D^-\pi^+\pi^-$ in the range $\sqrt{s} =$ 4.190–4.946 GeV. NODE=M181W;LINKAGE=L

[4] From a three-resonance fit to the Born cross section in the range $\sqrt{s} = 3.7730$–4.7008 GeV. Parameters depend on the existence or non-existence of a state near 4.5 GeV. NODE=M181W;LINKAGE=K

[5] From a three-resonance fit to the Born cross section in the range $\sqrt{s} = 4.008$–4.698 GeV. NODE=M181W;LINKAGE=G

[6] From a five-resonance fit to the cross section for $e^+e^- \to \gamma\gamma J/\psi \to \gamma\gamma\ell^+\ell^-$. NODE=M181W;LINKAGE=F

[7] From a two-resonance fit. Supersedes WANG 07D. NODE=M181W;LINKAGE=A

[8] From a two-resonance fit. NODE=M181W;LINKAGE=WA

[9] From a fit to the $e^+e^- \to \pi^+\pi^-\psi(3823)$ cross section between 4.23 and 4.70 GeV with two coherent Breit-Wigner resonances. The data is also consistent with a single peak with mass 4417.5 ± 26.2 ± 3.5 MeV and width 245 ± 48 ± 13 MeV. NODE=M181W;LINKAGE=I

[10] From a fit of the measured cross section in the range $\sqrt{s} = 3.808$–4.600 GeV. NODE=M181W;LINKAGE=BA

[11] From a three-resonance fit. Superseded by ABLIKIM 22AM. NODE=M181W;LINKAGE=J

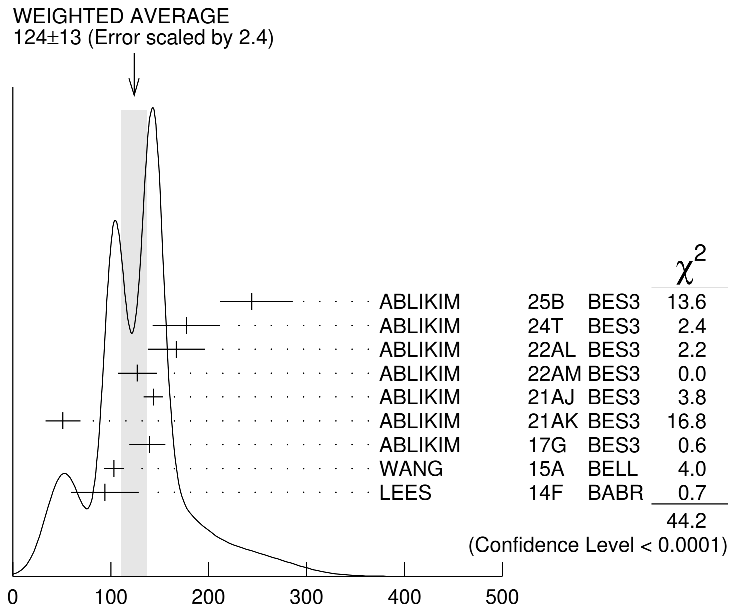
[12] From a fit to the cross section for $e^+ e^- \to \pi^+ \pi^- \psi(2S) \to 2(\pi^+ \pi^-) \ell^+ \ell^-$ obtained from 16 center-of-mass energies between 4.008 and 4.600 GeV and comprising 5.1 fb^{-1}. Superseded by ABLIKIM 21AJ. NODE=M181W;LINKAGE=C

[13] From a three-resonance fit. NODE=M181W;LINKAGE=E

[14] From a combined fit of BELLE, BABAR and BES3 $e^+ e^- \to \pi^+ \pi^- J/\psi$ and $e^+ e^- \to \pi^+ \pi^- \psi(2S)$ data. NODE=M181W;LINKAGE=D

[15] From a combined fit of AUBERT 07S and WANG 07D data with two resonances. NODE=M181W;LINKAGE=LI

[16] From a single-resonance fit. Systematic errors not estimated. NODE=M181W;LINKAGE=AU



$\psi(4360)$ DECAY MODES

NODE=M181215;NODE=M181

	Mode	Fraction (Γ_i/Γ)	
Γ_1	$e^+ e^-$	seen	DESIG=1;OUR EVAL;→ UNCHECKED ←
Γ_2	$h_c \pi^+ \pi^-$	seen	DESIG=12
Γ_3	$J/\psi \pi^+ \pi^-$	seen	DESIG=8;OUR EVAL;→ UNCHECKED ←
Γ_4	$\psi(2S) \pi^+ \pi^-$	seen	DESIG=2
Γ_5	$\psi(3770) \pi^+ \pi^-$	possibly seen	DESIG=11
Γ_6	$\psi_2(3823) \pi^+ \pi^-$	seen	DESIG=5
Γ_7	$J/\psi \eta$	seen	DESIG=4
Γ_8	$D^0 D^{*-} \pi^+$	not seen	DESIG=3;OUR EVAL;→ UNCHECKED ←
Γ_9	$D^+ D^- \pi^+ \pi^-$	seen	DESIG=17
Γ_{10}	$D_1(2420) \overline{D}$ + c.c.	possibly seen	DESIG=10
Γ_{11}	$\phi \eta$	not seen	DESIG=20
Γ_{12}	$\omega \pi^0$	not seen	DESIG=15
Γ_{13}	$\omega \eta$	not seen	DESIG=16
Γ_{14}	$p \overline{p} \eta$	not seen	DESIG=13
Γ_{15}	$p \overline{p} \omega$	not seen	DESIG=14
Γ_{16}	$\chi_{c1} \gamma$	not seen	DESIG=6;OUR EVAL;→ UNCHECKED ←
Γ_{17}	$\chi_{c2} \gamma$	not seen	DESIG=7;OUR EVAL;→ UNCHECKED ←
Γ_{18}	$\Sigma^+ \overline{\Sigma}^-$	not seen	DESIG=21;OUR EVAL;→ UNCHECKED ←
Γ_{19}	$\Sigma^0 \overline{\Sigma}^0$		DESIG=25
Γ_{20}	$\Xi^0 \overline{\Xi}^0$		DESIG=24
Γ_{21}	$\Xi^- \overline{\Xi}^+$	not seen	DESIG=18;OUR EVAL;→ UNCHECKED ←
Γ_{22}	$p K^- \overline{\Lambda}$ + c.c.	not seen	DESIG=19;OUR EVAL;→ UNCHECKED ←
Γ_{23}	$\Lambda \overline{\Xi}^+ K^-$ + c.c.	not seen	DESIG=22;OUR EVAL;→ UNCHECKED ←
Γ_{24}	$\Sigma^0 \overline{\Xi}^+ K^-$ + c.c.	not seen	DESIG=23;OUR EVAL;→ UNCHECKED ←
Γ_{25}	$p K^- K^- \overline{\Xi}^+$ + c.c.		DESIG=27

$\psi(4360)$ $\Gamma(i) \times \Gamma(e^+e^-)/\Gamma(\text{total})$

NODE=M181230

$\Gamma(h_c\pi^+\pi^-) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ — $\Gamma_2\Gamma_1/\Gamma$

NODE=M181R11
NODE=M181R11

VALUE (eV)	DOCUMENT ID	TECN	COMMENT
21 $^{+10}_{-8}$ OUR AVERAGE Error includes scale factor of 2.4. [12 ± 5 eV OUR 2025 AVERAGE]			
$29.1^{+5.7}_{-3.9}{}^{+4.4}_{-3.4}$	[1] ABLIKIM 25B	BES3	$e^+e^- \rightarrow \pi^+\pi^- h_c(1P)$
$11.6^{+5.0}_{-4.4}\pm1.9$	ABLIKIM 17G	BES3	$e^+e^- \rightarrow \pi^+\pi^- h_c(1P)$

NEW

[1] Using three coherent Breit-Wigner functions between 4.009 and 4.950 GeV. Second solution: $10.8^{+3.1}_{-2.3}$ eV.

NODE=M181R11;LINKAGE=A

$\Gamma(\psi(2S)\pi^+\pi^-) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ — $\Gamma_4\Gamma_1/\Gamma$

NODE=M181G1
NODE=M181G1

• • • We do not use the following data for averages, fits, limits, etc. • • •

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT	
10.7 ± 4.1		[1] ABLIKIM 21AJ	BES3	$e^+e^- \rightarrow \pi^+\pi^-\psi(2S)$	
20.7 ± 2.5		[2] ABLIKIM 21AJ	BES3	$e^+e^- \rightarrow \pi^+\pi^-\psi(2S)$	OCCUR=2
9.9 ± 4.1		[3] ABLIKIM 21AJ	BES3	$e^+e^- \rightarrow \pi^+\pi^-\psi(2S)$	OCCUR=3
19.4 ± 2.0		[4] ABLIKIM 21AJ	BES3	$e^+e^- \rightarrow \pi^+\pi^-\psi(2S)$	OCCUR=4
7.3 ± 2.8		[5] ABLIKIM 19K	BES3	$e^+e^- \rightarrow \pi^+\pi^-\psi(2S)$	
11.0 ± 3.8		[6] ABLIKIM 19K	BES3	$e^+e^- \rightarrow \pi^+\pi^-\psi(2S)$	OCCUR=2
$9.2\pm0.6\pm0.6$	279	[7] WANG 15A	BELL	10.58 $e^+e^- \rightarrow \gamma\pi^+\pi^-\psi(2S)$	
$10.9\pm0.6\pm0.7$	279	[8] WANG 15A	BELL	10.58 $e^+e^- \rightarrow \gamma\pi^+\pi^-\psi(2S)$	OCCUR=2
$6.0\pm1.0\pm0.5$	37	[5] LEES 14F	BABR	10.58 $e^+e^- \rightarrow \gamma\pi^+\pi^-\psi(2S)$	
$7.2\pm1.0\pm0.6$	37	[6] LEES 14F	BABR	10.58 $e^+e^- \rightarrow \gamma\pi^+\pi^-\psi(2S)$	OCCUR=2
$11.1^{+1.3}_{-1.2}$	74	[9] LIU 08H	RVUE	10.58 $e^+e^- \rightarrow \gamma\pi^+\pi^-\psi(2S)$	
12.3 ± 1.2	74	[10] LIU 08H	RVUE	10.58 $e^+e^- \rightarrow \gamma\pi^+\pi^-\psi(2S)$	OCCUR=2
$10.4\pm1.7\pm1.5$	47	[5] WANG 07D	BELL	10.58 $e^+e^- \rightarrow \gamma\pi^+\pi^-\psi(2S)$	
$11.8\pm1.8\pm1.4$	47	[6] WANG 07D	BELL	10.58 $e^+e^- \rightarrow \gamma\pi^+\pi^-\psi(2S)$	OCCUR=2

[1] Solution I of four equivalent solutions in a fit using three interfering resonances. Supersedes ABLIKIM 19K. NODE=M181G1;LINKAGE=E

[2] Solution II of four equivalent solutions in a fit using three interfering resonances. Supersedes ABLIKIM 19K. NODE=M181G1;LINKAGE=F

[3] Solution III of four equivalent solutions in a fit using three interfering resonances. Supersedes ABLIKIM 19K. NODE=M181G1;LINKAGE=G

[4] Solution IV of four equivalent solutions in a fit using three interfering resonances. Supersedes ABLIKIM 19K. NODE=M181G1;LINKAGE=H

[5] Solution I of two equivalent solutions in a fit using two interfering resonances. NODE=M181G1;LINKAGE=WA

[6] Solution II of two equivalent solutions in a fit using two interfering resonances. NODE=M181G1;LINKAGE=WN

[7] Solution I of two equivalent solutions from a fit using two interfering resonances. Supersedes WANG 07D. NODE=M181G1;LINKAGE=A

[8] Solution II of two equivalent solutions from a fit using two interfering resonances. Supersedes WANG 07D. NODE=M181G1;LINKAGE=B

[9] Solution I in a combined fit of AUBERT 07S and WANG 07D data with two resonances. NODE=M181G1;LINKAGE=LI

[10] Solution II in a combined fit of AUBERT 07S and WANG 07D data with two resonances. NODE=M181G1;LINKAGE=LU

$\Gamma(J/\psi\eta) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ — $\Gamma_7\Gamma_1/\Gamma$

NODE=M181G01
NODE=M181G01

• • • We do not use the following data for averages, fits, limits, etc. • • •

VALUE (eV)	CL%	DOCUMENT ID	TECN	COMMENT	
$1.8\pm0.6\pm0.3$		[1] ABLIKIM 24T	BES3	$e^+e^- \rightarrow \eta J/\psi$	
$2.1\pm0.7\pm0.3$		[2] ABLIKIM 24T	BES3	$e^+e^- \rightarrow \eta J/\psi$	OCCUR=2
$4.3\pm1.3\pm0.5$		[3] ABLIKIM 24T	BES3	$e^+e^- \rightarrow \eta J/\psi$	OCCUR=3
$5.0\pm1.5\pm0.5$		[4] ABLIKIM 24T	BES3	$e^+e^- \rightarrow \eta J/\psi$	OCCUR=4
3.4 ± 2.2		[5] ABLIKIM 20O	BES3	$e^+e^- \rightarrow \eta J/\psi$	
1.5 ± 1.0		[6] ABLIKIM 20O	BES3	$e^+e^- \rightarrow \eta J/\psi$	OCCUR=2
1.7 ± 1.1		[7] ABLIKIM 20O	BES3	$e^+e^- \rightarrow \eta J/\psi$	OCCUR=3
<6.8	90	WANG 13B	BELL	$e^+e^- \rightarrow J/\psi\eta\gamma$	

[1] Solution 1 of 4. Supersedes ABLIKIM 20O. NODE=M181G01;LINKAGE=D

[2] Solution 2 of 4. Supersedes ABLIKIM 20O. NODE=M181G01;LINKAGE=E

[3] Solution 3 of 4. Supersedes ABLIKIM 20O. NODE=M181G01;LINKAGE=F

[4] Solution 4 of 4. Supersedes ABLIKIM 20O. NODE=M181G01;LINKAGE=G

[5] Solution 1 of three equivalent fit solutions using three resonant structures. NODE=M181G01;LINKAGE=A

[6] Solution 2 of three equivalent fit solutions using three resonant structures. NODE=M181G01;LINKAGE=B

[7] Solution 3 of three equivalent fit solutions using three resonant structures. NODE=M181G01;LINKAGE=C

$\Gamma(\chi_{c1}\gamma) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_{16}\Gamma_1/\Gamma$

NODE=M181G02
NODE=M181G02

VALUE (eV)	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
<0.57	90	[1] HAN	15	BELL	10.58 $e^+e^- \rightarrow \chi_{c1}\gamma$

[1] Using B($\eta \rightarrow \gamma\gamma$) = (39.41 ± 0.21)%.

NODE=M181G02;LINKAGE=A

$\Gamma(\chi_{c2}\gamma) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_{17}\Gamma_1/\Gamma$

NODE=M181G03
NODE=M181G03

VALUE (eV)	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
<1.9	90	[1] HAN	15	BELL	10.58 $e^+e^- \rightarrow \chi_{c2}\gamma$

[1] Using B($\eta \rightarrow \gamma\gamma$) = (39.41 ± 0.21)%.

NODE=M181G03;LINKAGE=A

$\Gamma(\Sigma^+\overline{\Sigma}^-) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_{18}\Gamma_1/\Gamma$

NODE=M181R19
NODE=M181R19

VALUE (eV)	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
<118.8 × 10^{-3}	90	[1] ABLIKIM	24AH	BES3	$e^+e^- \rightarrow \Sigma^+\overline{\Sigma}^-$

[1] Interference effect between resonance and continuum amplitudes is considered. Two solutions from the fit.

NODE=M181R19;LINKAGE=A

$\Gamma(\Sigma^0\overline{\Sigma}^0) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_{19}\Gamma_1/\Gamma$

NODE=M181R23
NODE=M181R23

VALUE (eV)	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
<29.3 × 10^{-3}	90	[1] ABLIKIM	25U	BES3	$e^+e^- \rightarrow \Sigma^0\overline{\Sigma}^0$

[1] Interference effect between resonance and continuum amplitudes is considered. Upper limit is for the larger of the two solutions from the fit.

NODE=M181R23;LINKAGE=A

$\Gamma(\Xi^0\overline{\Xi}^0) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_{20}\Gamma_1/\Gamma$

NODE=M181R22
NODE=M181R22

VALUE (eV)	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
<84.5 × 10^{-3}	90	[1] ABLIKIM	24CD	BES3	$e^+e^- \rightarrow \psi(4360)$

[1] From a fit to $e^+e^- \rightarrow \Xi^0\overline{\Xi}^0$ cross sections.

NODE=M181R22;LINKAGE=A

$\Gamma(\Xi^-\overline{\Xi}^+) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_{21}\Gamma_1/\Gamma$

NODE=M181R15
NODE=M181R15

VALUE (eV)	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
<44.8 × 10^{-3}	90	[1] ABLIKIM	23BK	BES3	$e^+e^- \rightarrow \psi(4360)$

[1] From a fit to $e^+e^- \rightarrow \Xi^-\overline{\Xi}^+$ cross sections.

NODE=M181R15;LINKAGE=A

$\Gamma(pK^-\overline{\Lambda}+\text{c.c.}) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_{22}\Gamma_1/\Gamma$

NODE=M181R17
NODE=M181R17

VALUE (eV)	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
<4.7 × 10^{-3}	90	[1] ABLIKIM	23BL	BES3	$e^+e^- \rightarrow \psi(4360)$

[1] From a fit to $e^+e^- \rightarrow pK^-\overline{\Lambda}+$ c.c. cross sections.

NODE=M181R17;LINKAGE=A

$\Gamma(\Lambda\overline{\Xi}^+K^-+\text{c.c.}) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_{23}\Gamma_1/\Gamma$

NODE=M181R20
NODE=M181R20

VALUE (eV)	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
<35.8 × 10^{-3}	90	[1] ABLIKIM	24AL	BES3	$e^+e^- \rightarrow \Lambda\overline{\Xi}^+K^- +$ c.c.

[1] A fit to the Born cross section of $e^+e^- \rightarrow \Lambda\overline{\Xi}^+K^- +$ c.c. including interference with the continuum. Two solutions from the fit.

NODE=M181R20;LINKAGE=A

$\Gamma(\Sigma^0\overline{\Xi}^+K^-+\text{c.c.}) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_{24}\Gamma_1/\Gamma$

NODE=M181R21
NODE=M181R21

VALUE (eV)	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
<2.8 × 10^{-3}	90	[1] ABLIKIM	24AL	BES3	$e^+e^- \rightarrow \Sigma^0\overline{\Xi}^+K^- +$ c.c.

[1] A fit to the Born cross section of $e^+e^- \rightarrow \Sigma^0\overline{\Xi}^+K^- +$ c.c. including interference with the continuum. Two solutions from the fit.

NODE=M181R21;LINKAGE=A

$\Gamma(e^+e^-) \times \Gamma(pK^-K^-\overline{\Xi}^+ + \text{c.c.})/\Gamma_{total}$ $\Gamma_1\Gamma_{25}/\Gamma$

NODE=M181R24
NODE=M181R24

VALUE (eV)	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
<66.6 × 10^{-3}	90	ABLIKIM	25CF	BES3	$e^+e^- \rightarrow pK^-K^-\overline{\Xi}^+ +$ c.c.

$\psi(4360)$ BRANCHING RATIOS

NODE=M181225

$\Gamma(h_c\pi^+\pi^-)/\Gamma_{total}$ Γ_2/Γ

NODE=M181R08
NODE=M181R08

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
seen	ABLIKIM	17G	BES3	$e^+e^- \rightarrow \pi^+\pi^- h_c$

$\Gamma(\psi(2S)\pi^+\pi^-)/\Gamma_{total}$ Γ_4/Γ

NODE=M181R00
NODE=M181R00

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
seen	[1] ABLIKIM	17V	BES3	$e^+e^- \rightarrow \pi^+\pi^-\psi(2S)$

[1] From a fit to the cross section for $e^+e^- \rightarrow \pi^+\pi^-\psi(2S) \rightarrow 2(\pi^+\pi^-)\ell^+\ell^-$ obtained from 16 center-of-mass energies between 4.008 and 4.600 GeV and comprising 5.1 fb^{-1}.

NODE=M181R00;LINKAGE=A

$\Gamma(\psi(2S)\pi^+\pi^-)/\Gamma(J/\psi\pi^+\pi^-)$ Γ_4/Γ_3

NODE=M181R04

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$(0.81 \pm 0.12 \pm 0.13)$ to $(42 \pm 15 \pm 15)$	[1] ZHANG	17C	RVUE	$e^+e^- \to \pi^+\pi^- J/\psi$ or $\psi(2S)$

[1] From a combined fit of BELLE, BABAR and BES3 $e^+e^- \to \pi^+\pi^- J/\psi$ and $e^+e^- \to \pi^+\pi^- \psi(2S)$ data.

NODE=M181R04;LINKAGE=A

$\Gamma(\psi(3770)\pi^+\pi^-)/\Gamma_{total}$ Γ_5/Γ

NODE=M181R06

VALUE	DOCUMENT ID		TECN	COMMENT
possibly seen	[1] ABLIKIM	19AR	BES3	$e^+e^- \to \pi^+\pi^- D\overline{D}$

[1] Observe $e^+e^- \to \pi^+\pi^- \psi(3770)$ at $\sqrt{s} = 4.26$, 4.36, and 4.42 GeV but cannot establish if continuum or resonant.

NODE=M181R06;LINKAGE=A

$\Gamma(\psi_2(3823)\pi^+\pi^-)/\Gamma_{total}$ Γ_6/Γ

NODE=M181R03

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
seen		[1] ABLIKIM	22R	BES3	$e^+e^- \to \pi^+\pi^- \chi_{c1}\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
possibly seen	19	[2] ABLIKIM	15S	BES3	$e^+e^- \to \pi^+\pi^- \chi_{c1}\gamma$

[1] From a fit to the $e^+e^- \to \pi^+\pi^- \psi(3823)$ cross section between 4.23 and 4.70 GeV with two coherent Breit-Wigner resonances.

NODE=M181R03;LINKAGE=C

[2] From a fit of $e^+e^- \to \pi^+\pi^- \psi_2(3823)$, $\psi_2(3823) \to \chi_{c1}\gamma$ cross sections taken at $\sqrt{s}$ values of 4.23, 4.26, 4.36, 4.42, and 4.60 GeV to the $\psi(4360)$ line shape.

NODE=M181R03;LINKAGE=A

$\Gamma(J/\psi\eta)/\Gamma_{total}$ Γ_7/Γ

NODE=M181R07

VALUE	DOCUMENT ID		TECN	COMMENT
seen	[1] ABLIKIM	24T	BES3	$e^+e^- \to \eta J/\psi$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
seen	[2] ABLIKIM	20O	BES3	$e^+e^- \to \eta J/\psi$

[1] Supersedes ABLIKIM 20O.

NODE=M181R07;LINKAGE=B

[2] With a significance of 6.0 σ.

NODE=M181R07;LINKAGE=A

$\Gamma(D^0 D^{*-}\pi^+)/\Gamma_{total} \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_8/\Gamma \times \Gamma_1/\Gamma$

NODE=M181R02

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$\mathbf{<0.72 \times 10^{-6}}$	90	[1] PAKHLOVA	09	BELL	$e^+e^- \to \psi(4360) \to D^0 D^{*-}\pi^+$

[1] Using $4355^{+9}_{-10} \pm 9$ MeV for the mass of $\psi(4360)$.

NODE=M181R02;LINKAGE=PA

$\Gamma(D^0 D^{*-}\pi^+)/\Gamma(\psi(2S)\pi^+\pi^-)$ Γ_8/Γ_4

NODE=M181R01

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<8	90	PAKHLOVA	09	BELL	$e^+e^- \to \psi(4360) \to D^0 D^{*-}\pi^+$

$\Gamma(D^+ D^-\pi^+\pi^-)/\Gamma_{total}$ Γ_9/Γ

NODE=M181R14

VALUE	DOCUMENT ID		TECN	COMMENT
seen	[1] ABLIKIM	22AL	BES3	$e^+e^- \to \pi^+\pi^- D^+ D^-$

[1] From a fit to the cross section for $e^+e^- \to D^+ D^- \pi^+\pi^-$ in the range $\sqrt{s} =$ 4.190–4.946 GeV.

NODE=M181R14;LINKAGE=A

$\Gamma(D_1(2420)\overline{D} + \text{c.c.})/\Gamma_{total}$ Γ_{10}/Γ

NODE=M181R05

VALUE	DOCUMENT ID		TECN	COMMENT
possibly seen	[1] ABLIKIM	19AR	BES3	$e^+e^- \to \pi^+\pi^- D\overline{D}$

[1] Evidence for $e^+e^- \to D_1(2420)\overline{D}$+ c.c. between $\sqrt{s} = 4.3$ and 4.6 GeV, not necessarily resonant.

NODE=M181R05;LINKAGE=A

$\Gamma(\phi\eta)/\Gamma_{total}$ Γ_{11}/Γ

NODE=M181R18

VALUE	DOCUMENT ID		TECN	COMMENT
not seen	ABLIKIM	23BT	BES3	$e^+e^- \to \phi\eta$

$\Gamma(\omega\pi^0)/\Gamma_{total}$ Γ_{12}/Γ

NODE=M181R12

VALUE	DOCUMENT ID		TECN	COMMENT
not seen	ABLIKIM	22K	BES3	$e^+e^- \to \omega\pi^0$

$\Gamma(\omega\eta)/\Gamma_{total}$ Γ_{13}/Γ

NODE=M181R13

VALUE	DOCUMENT ID		TECN	COMMENT
not seen	ABLIKIM	22K	BES3	$e^+e^- \to \omega\eta$

$\Gamma(p\overline{p}\eta)/\Gamma_{total}$ Γ_{14}/Γ

NODE=M181R09

VALUE	DOCUMENT ID		TECN	COMMENT
not seen	ABLIKIM	21AN	BES3	$e^+e^- \rightarrow p\overline{p}\eta$

$\Gamma(p\overline{p}\omega)/\Gamma_{total}$ Γ_{15}/Γ

NODE=M181R10

VALUE	DOCUMENT ID		TECN	COMMENT
not seen	ABLIKIM	21AN	BES3	$e^+e^- \rightarrow p\overline{p}\omega$

$\psi(4360)$ REFERENCES

NODE=M181

ABLIKIM	25B	PRL 135 071901	M. Ablikim *et al.*	(BESIII Collab.)	REFID=63240
ABLIKIM	25CF	JHEP 2511 111	M. Ablikim *et al.*	(BESIII Collab.)	REFID=63628
ABLIKIM	25U	PR D111 L051502	M. Ablikim *et al.*	(BESIII Collab.)	REFID=63265
ABLIKIM	24AH	JHEP 2405 022	M. Ablikim *et al.*	(BESIII Collab.)	REFID=62688
ABLIKIM	24AL	JHEP 2407 258	M. Ablikim *et al.*	(BESIII Collab.)	REFID=62693
ABLIKIM	24CD	JHEP 2411 062	M. Ablikim *et al.*	(BESIII Collab.)	REFID=63037
ABLIKIM	24T	PR D109 092012	M. Ablikim *et al.*	(BESIII Collab.)	REFID=62671
ABLIKIM	23BK	JHEP 2311 228	M. Ablikim *et al.*	(BESIII Collab.)	REFID=62437
ABLIKIM	23BL	JHEP 2312 027	M. Ablikim *et al.*	(BESIII Collab.)	REFID=62438
ABLIKIM	23BT	PR D108 112011	M. Ablikim *et al.*	(BESIII Collab.)	REFID=62516
ABLIKIM	22AL	PR D106 052012	M. Ablikim *et al.*	(BESIII Collab.)	REFID=61884
ABLIKIM	22AM	PR D106 072001	M. Ablikim *et al.*	(BESIII Collab.)	REFID=61885
ABLIKIM	22K	JHEP 2207 064	M. Ablikim *et al.*	(BESIII Collab.)	REFID=61648
ABLIKIM	22R	PRL 129 102003	M. Ablikim *et al.*	(BESIII Collab.)	REFID=61664
ABLIKIM	21AJ	PR D104 052012	M. Ablikim *et al.*	(BESIII Collab.)	REFID=61441
ABLIKIM	21AK	PR D104 092001	M. Ablikim *et al.*	(BESIII Collab.)	REFID=61443
ABLIKIM	21AN	PR D104 092008	M. Ablikim *et al.*	(BESIII Collab.)	REFID=61446
ABLIKIM	20O	PR D102 031101	M. Ablikim *et al.*	(BESIII Collab.)	REFID=60344
ABLIKIM	19AR	PR D100 032005	M. Ablikim *et al.*	(BESIII Collab.)	REFID=59910
ABLIKIM	19K	PR D99 019903 (errat.)	M. Ablikim *et al.*	(BESIII Collab.)	REFID=59611
ABLIKIM	17B	PRL 118 092001	M. Ablikim *et al.*	(BESIII Collab.)	REFID=57755
ABLIKIM	17G	PRL 118 092002	M. Ablikim *et al.*	(BESIII Collab.)	REFID=57915
ABLIKIM	17V	PR D96 032004	M. Ablikim *et al.*	(BESIII Collab.)	REFID=58029
Also		PR D99 019903 (errat.)	M. Ablikim *et al.*	(BESIII Collab.)	REFID=59611
ZHANG	17B	PR D96 054008	J. Zhang, J. Zhang		REFID=58219
ZHANG	17C	EPJ C77 727	J. Zhang, L. Yuan		REFID=58463
ABLIKIM	15S	PRL 115 011803	M. Ablikim *et al.*	(BESIII Collab.)	REFID=56784
HAN	15	PR D92 012011	Y.L. Han *et al.*	(BELLE Collab.)	REFID=56816
WANG	15A	PR D91 112007	X.L. Wang *et al.*	(BELLE Collab.)	REFID=56839
LEES	14F	PR D89 111103	J.P. Lees *et al.*	(BABAR Collab.)	REFID=55938
WANG	13B	PR D87 051101	X.L. Wang *et al.*	(BELLE Collab.)	REFID=55377
PAKHLOVA	09	PR D80 091101	G. Pakhlova *et al.*	(BELLE Collab.)	REFID=53143
LIU	08H	PR D78 014032	Z.Q. Liu, X.S. Qin, C.Z. Yuan		REFID=52296
AUBERT	07S	PRL 98 212001	B. Aubert *et al.*	(BABAR Collab.)	REFID=51724
WANG	07D	PRL 99 142002	X.L. Wang *et al.*	(BELLE Collab.)	REFID=51959