

$\psi(4040)$ [a]

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

[a] J^{PC} known by production in e^+e^- via single photon annihilation. I^G is not known; interpretation of this state as a single resonance is unclear because of the expectation of substantial threshold effects in this energy region.

$\psi(4040)$ MASS

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
4039.6 ± 4.3	¹ ABLIKIM	08D BES2	$e^+e^- \rightarrow$ hadrons
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
4034 ± 6	² MO	10 RVUE	$e^+e^- \rightarrow$ hadrons
4037 ± 2	³ SETH	05A RVUE	$e^+e^- \rightarrow$ hadrons
4040 ± 1	⁴ SETH	05A RVUE	$e^+e^- \rightarrow$ hadrons
4040 ± 10	BRANDELIK	78C DASP	e^+e^-

¹ Reanalysis of data presented in BAI 02C. From a global fit over the center-of-mass energy region 3.7–5.0 GeV covering the $\psi(3770)$, $\psi(4040)$, $\psi(4160)$, and $\psi(4415)$ resonances. Phase angle fixed in the fit to $\delta = (130 \pm 46)^\circ$.

² Reanalysis of data presented in BAI 00 and BAI 02C. From a global fit over the center-of-mass energy 3.8–4.8 GeV covering the $\psi(4040)$, $\psi(4160)$ and $\psi(4415)$ resonances and including interference effects.

³ From a fit to Crystal Ball (OSTERHELD 86) data.

⁴ From a fit to BES (BAI 02C) data.

$\psi(4040)$ WIDTH

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
84.5 ± 12.3	¹ ABLIKIM	08D BES2	$e^+e^- \rightarrow$ hadrons
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
87 ± 11	² MO	10 RVUE	$e^+e^- \rightarrow$ hadrons
85 ± 10	³ SETH	05A RVUE	$e^+e^- \rightarrow$ hadrons
89 ± 6	⁴ SETH	05A RVUE	$e^+e^- \rightarrow$ hadrons
52 ± 10	BRANDELIK	78C DASP	e^+e^-

¹ Reanalysis of data presented in BAI 02C. From a global fit over the center-of-mass energy region 3.7–5.0 GeV covering the $\psi(3770)$, $\psi(4040)$, $\psi(4160)$, and $\psi(4415)$ resonances. Phase angle fixed in the fit to $\delta = (130 \pm 46)^\circ$.

² Reanalysis of data presented in BAI 00 and BAI 02C. From a global fit over the center-of-mass energy 3.8–4.8 GeV covering the $\psi(4040)$, $\psi(4160)$ and $\psi(4415)$ resonances and including interference effects.

³ From a fit to Crystal Ball (OSTERHELD 86) data.

⁴ From a fit to BES (BAI 02C) data.

$\psi(4040)$ DECAY MODES

Due to the complexity of the $c\bar{c}$ threshold region, in this listing, “seen” (“not seen”) means that a cross section for the mode in question has been measured at effective \sqrt{s} near this particle’s central mass value, more (less) than 2σ above zero, without regard to any peaking behavior in \sqrt{s} or absence thereof. See mode listing(s) for details and references.

Mode	Fraction (Γ_i/Γ)	Confidence level
Γ_1 $e^+ e^-$	$(1.02 \pm 0.17) \times 10^{-5}$	
Γ_2 $D\bar{D}$	seen	
Γ_3 $D^0\bar{D}^0$	seen	
Γ_4 $D^+ D^-$	seen	
Γ_5 $D^*\bar{D} + \text{c.c.}$	seen	
Γ_6 $D^*(2007)^0\bar{D}^0 + \text{c.c.}$	seen	
Γ_7 $D^*(2010)^+ D^- + \text{c.c.}$	seen	
Γ_8 $D^*\bar{D}^*$	seen	
Γ_9 $D^*(2007)^0\bar{D}^*(2007)^0$	seen	
Γ_{10} $D^*(2010)^+ D^*(2010)^-$	seen	
Γ_{11} $D\bar{D}\pi$ (excl. $D^*\bar{D}$)	not seen	
Γ_{12} $D^0 D^- \pi^+ + \text{c.c.}$ (excl. $D^*(2010)^+ D^- + \text{c.c.}$)	not seen	
Γ_{13} $D\bar{D}^*\pi$ (excl. $D^*\bar{D}^*$)	not seen	
Γ_{14} $D^0\bar{D}^*\pi + \text{c.c.}$ (excl. $D^*(2010)^+ D^*(2010)^-$)	seen	
Γ_{15} $D_s^+ D_s^-$	seen	
Γ_{16} $\pi^+ \pi^+ \pi^- \pi^- \pi^0$	seen	
Γ_{17} $J/\psi(1S)$ hadrons	seen	
Γ_{18} $J/\psi \pi^+ \pi^-$	$< 4 \times 10^{-3}$	90%
Γ_{19} $J/\psi \pi^0 \pi^0$	$< 2 \times 10^{-3}$	90%
Γ_{20} $J/\psi \eta$	$(5.2 \pm 0.7) \times 10^{-3}$	
Γ_{21} $J/\psi \pi^0$	$< 2.8 \times 10^{-4}$	90%
Γ_{22} $J/\psi \pi^+ \pi^- \pi^0$	$< 2 \times 10^{-3}$	90%
Γ_{23} $\chi_{c1} \gamma$	$< 3.4 \times 10^{-3}$	90%
Γ_{24} $\chi_{c2} \gamma$	$< 5 \times 10^{-3}$	90%
Γ_{25} $\chi_{c1} \pi^+ \pi^- \pi^0$	$< 1.1 \%$	90%
Γ_{26} $\chi_{c2} \pi^+ \pi^- \pi^0$	$< 3.2 \%$	90%
Γ_{27} $h_c(1P) \pi^+ \pi^-$	$< 3 \times 10^{-3}$	90%
Γ_{28} $\phi \pi^+ \pi^-$	$< 3 \times 10^{-3}$	90%
Γ_{29} $\Lambda\bar{\Lambda} \pi^+ \pi^-$	$< 2.9 \times 10^{-4}$	90%
Γ_{30} $\Lambda\bar{\Lambda} \pi^0$	$< 9 \times 10^{-5}$	90%
Γ_{31} $\Lambda\bar{\Lambda} \eta$	$< 3.0 \times 10^{-4}$	90%
Γ_{32} $\Lambda\bar{\Lambda}$	$< 6 \times 10^{-6}$	90%
Γ_{33} $\Sigma^+ \bar{\Sigma}^-$	$< 1.3 \times 10^{-4}$	90%
Γ_{34} $\Sigma^0 \bar{\Sigma}^0$	$< 7 \times 10^{-5}$	90%

Γ_{35}	$\Xi^+ \Xi^-$	< 1.6	$\times 10^{-4}$	90%
Γ_{36}	$\Xi^0 \Xi^0$	< 1.8	$\times 10^{-4}$	90%
Γ_{37}	$\Xi^- \Xi^+$	< 6	$\times 10^{-5}$	90%
Γ_{38}	$\Lambda \Xi^+ K^- + \text{c.c.}$	< 7	$\times 10^{-5}$	90%
Γ_{39}	$\Sigma^0 \Xi^+ K^- + \text{c.c.}$	< 1.5	$\times 10^{-5}$	90%
Γ_{40}	$p K^- K^- \Xi^+ + \text{c.c.}$	< 4	$\times 10^{-5}$	90%
Γ_{41}	$\mu^+ \mu^-$	(9 ± 6)	$\times 10^{-6}$	

$\psi(4040)$ PARTIAL WIDTHS

$\Gamma(e^+ e^-)$

Γ_1

VALUE (keV)	DOCUMENT ID	TECN	COMMENT
0.86 ± 0.07 OUR ESTIMATE			
0.83 ± 0.20	¹ ABLIKIM	08D BES2	$e^+ e^- \rightarrow \text{hadrons}$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.6 to 1.4	² MO	10 RVUE	$e^+ e^- \rightarrow \text{hadrons}$
0.88 ± 0.11	³ SETH	05A RVUE	$e^+ e^- \rightarrow \text{hadrons}$
0.91 ± 0.13	⁴ SETH	05A RVUE	$e^+ e^- \rightarrow \text{hadrons}$
0.75 ± 0.15	BRANDELIK	78C DASP	$e^+ e^-$

¹ Reanalysis of data presented in BAI 02C. From a global fit over the center-of-mass energy region 3.7–5.0 GeV covering the $\psi(3770)$, $\psi(4040)$, $\psi(4160)$, and $\psi(4415)$ resonances. Phase angle fixed in the fit to $\delta = (130 \pm 46)^\circ$.

² Reanalysis of data presented in BAI 00 and BAI 02C. From a global fit over the center-of-mass energy 3.8–4.8 GeV covering the $\psi(4040)$, $\psi(4160)$ and $\psi(4415)$ resonances and including interference effects. Four sets of solutions are obtained with the same fit quality, mass and total width, but with different $e^+ e^-$ partial widths. We quote only the range of values.

³ From a fit to Crystal Ball (OSTERHELD 86) data.

⁴ From a fit to BES (BAI 02C) data.

$\Gamma(\mu^+ \mu^-)$

Γ_{41}

VALUE (keV)	DOCUMENT ID	TECN	COMMENT
$0.73 \pm 0.48 \pm 0.12$	^{1,2} ABLIKIM	20AG BES3	$e^+ e^- \rightarrow \mu^+ \mu^-$

¹ From a fit to the $e^+ e^- \rightarrow \mu^+ \mu^-$ cross section between 3.8 and 4.6 GeV to the coherent sum of four resonant amplitudes assuming $\Gamma(\mu^+ \mu^-) = \Gamma(e^+ e^-)$.

² From solution 1 of 8 with equal fit quality. Other solutions range from $0.58 \pm 0.52 \pm 0.10$ to $0.80 \pm 0.48 \pm 0.13$ keV.

$\psi(4040) \Gamma(i) \times \Gamma(e^+ e^-) / \Gamma(\text{total})$

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

$\Gamma_{20} \Gamma_1 / \Gamma$

VALUE (eV)	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
$1.0 \pm 0.2 \pm 0.1$	¹ ABLIKIM	24T BES3	$e^+ e^- \rightarrow \eta J/\psi$
$7.1 \pm 0.6 \pm 0.9$	² ABLIKIM	24T BES3	$e^+ e^- \rightarrow \eta J/\psi$
$1.1 \pm 0.2 \pm 0.2$	³ ABLIKIM	24T BES3	$e^+ e^- \rightarrow \eta J/\psi$
$7.8 \pm 0.6 \pm 1.1$	⁴ ABLIKIM	24T BES3	$e^+ e^- \rightarrow \eta J/\psi$
1.5 ± 0.3	⁵ ABLIKIM	200 BES3	$e^+ e^- \rightarrow \eta J/\psi$
1.4 ± 0.3	⁶ ABLIKIM	200 BES3	$e^+ e^- \rightarrow \eta J/\psi$
7.0 ± 0.6	⁷ ABLIKIM	200 BES3	$e^+ e^- \rightarrow \eta J/\psi$

- ¹ Solution 1 of 4. Supersedes ABLIKIM 200.
² Solution 2 of 4. Supersedes ABLIKIM 200.
³ Solution 3 of 4. Supersedes ABLIKIM 200.
⁴ Solution 4 of 4. Supersedes ABLIKIM 200.
⁵ Solution 1 of three equivalent fit solutions using three resonant structures.
⁶ Solution 2 of three equivalent fit solutions using three resonant structures.
⁷ Solution 3 of three equivalent fit solutions using three resonant structures.

$$\Gamma(\chi_{c1}\gamma) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{23}\Gamma_1/\Gamma$$

VALUE (eV)	CL%	DOCUMENT ID	TECN	COMMENT
<2.9	90	¹ HAN	15	BELL 10.58 $e^+e^- \rightarrow \chi_{c1}\gamma$

¹ Using $B(\eta \rightarrow \gamma\gamma) = (39.41 \pm 0.21)\%$.

$$\Gamma(\chi_{c2}\gamma) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{24}\Gamma_1/\Gamma$$

VALUE (eV)	CL%	DOCUMENT ID	TECN	COMMENT
<4.6	90	¹ HAN	15	BELL 10.58 $e^+e^- \rightarrow \chi_{c2}\gamma$

¹ Using $B(\eta \rightarrow \gamma\gamma) = (39.41 \pm 0.21)\%$.

$$\Gamma(\Lambda\bar{\Lambda}) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{32}\Gamma_1/\Gamma$$

VALUE (eV)	CL%	DOCUMENT ID	TECN	COMMENT
<5.5 × 10⁻³	90	¹ ABLIKIM	21AS	BES3 $e^+e^- \rightarrow \psi(4040)$

¹ From a measurement of the $e^+e^- \rightarrow \Lambda\bar{\Lambda}$ cross section between 3.5 and 4.6 GeV.

$$\Gamma(\Sigma^+\bar{\Sigma}^-) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{33}\Gamma_1/\Gamma$$

VALUE (eV)	CL%	DOCUMENT ID	TECN	COMMENT
<216.6 × 10⁻³	90	¹ ABLIKIM	24AH	BES3 $e^+e^- \rightarrow \Sigma^+\bar{\Sigma}^-$

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

$$\Gamma(\Sigma^0\bar{\Sigma}^0) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{34}\Gamma_1/\Gamma$$

VALUE (eV)	CL%	DOCUMENT ID	TECN	COMMENT
<66.1 × 10⁻³	90	¹ ABLIKIM	25U	BES3 $e^+e^- \rightarrow \Sigma^0\bar{\Sigma}^0$

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

$$\Gamma(\Xi^0\bar{\Xi}^0) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{36}\Gamma_1/\Gamma$$

VALUE (eV)	CL%	DOCUMENT ID	TECN	COMMENT
<83.4 × 10⁻³	90	¹ ABLIKIM	24CD	BES3 $e^+e^- \rightarrow \psi(4040)$

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

$$\Gamma(\Xi^-\bar{\Xi}^+) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{37}\Gamma_1/\Gamma$$

VALUE (eV)	CL%	DOCUMENT ID	TECN	COMMENT
<51.9 × 10⁻³	90	¹ ABLIKIM	23BK	BES3 $e^+e^- \rightarrow \psi(4040)$

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

$$\Gamma(\Lambda\bar{\Xi}^+K^- + \text{c.c.}) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{38}\Gamma_1/\Gamma$$

VALUE (eV)	CL%	DOCUMENT ID	TECN	COMMENT
<62.0 × 10⁻³	90	¹ ABLIKIM	24AL	BES3 $e^+e^- \rightarrow \Lambda\bar{\Xi}^+K^- + \text{c.c.}$

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

$$\Gamma(\Sigma^0 \Xi^+ K^- + \text{c.c.}) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{39} \Gamma_1 / \Gamma$$

VALUE (eV)	CL%	DOCUMENT ID	TECN	COMMENT
$<12.5 \times 10^{-3}$	90	¹ ABLIKIM	24AL BES3	$e^+ e^- \rightarrow \Sigma^0 \Xi^+ K^- + \text{c.c.}$

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

$$\Gamma(e^+ e^-) \times \Gamma(p K^- K^- \Xi^+ + \text{c.c.}) / \Gamma_{\text{total}} \quad \Gamma_1 \Gamma_{40} / \Gamma$$

VALUE (eV)	CL%	DOCUMENT ID	TECN	COMMENT
$<35.6 \times 10^{-3}$	90	ABLIKIM	25CF BES3	$e^+ e^- \rightarrow p K^- K^- \Xi^+ + \text{c.c.}$

$$\psi(4040) \Gamma(i) \times \Gamma(e^+ e^-) / \Gamma^2(\text{total})$$

$$\Gamma(J/\psi \eta) / \Gamma_{\text{total}} \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{20} / \Gamma \times \Gamma_1 / \Gamma$$

VALUE (units 10^{-8})	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

$5.1 \pm 1.4 \pm 1.5$	¹ WANG	13B	BELL	$e^+ e^- \rightarrow J/\psi \eta \gamma$
$12.8 \pm 2.1 \pm 1.9$	² WANG	13B	BELL	$e^+ e^- \rightarrow J/\psi \eta \gamma$

¹ Solution I of two equivalent solutions in a fit using two interfering resonances. Mass and width fixed at 4039 MeV and 80 MeV, respectively.

² Solution II of two equivalent solutions in a fit using two interfering resonances. Mass and width fixed at 4039 MeV and 80 MeV, respectively.

$\psi(4040)$ BRANCHING RATIOS

$$\Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_1 / \Gamma$$

VALUE (units 10^{-5})	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

~ 1.0	FELDMAN	77	MRK1	$e^+ e^-$
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$$\Gamma(D^0 \bar{D}^0) / \Gamma_{\text{total}} \quad \Gamma_3 / \Gamma$$

VALUE	DOCUMENT ID	TECN	COMMENT
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seen	¹ ABLIKIM	24BH	BES3	$e^+ e^- \rightarrow D^0 \bar{D}^0$
seen	AUBERT	09M	BABR	$e^+ e^- \rightarrow D^0 \bar{D}^0 \gamma$
seen	CRONIN-HEN..09	CLEO		$e^+ e^- \rightarrow D^0 \bar{D}^0$
seen	PAKHLOVA	08	BELL	$e^+ e^- \rightarrow D^0 \bar{D}^0 \gamma$

¹ A precision measurement of the $e^+ e^- \rightarrow D^0 \bar{D}^0$ cross section shows complex structure in this mass region.

$$\Gamma(D^+ D^-) / \Gamma_{\text{total}} \quad \Gamma_4 / \Gamma$$

VALUE	DOCUMENT ID	TECN	COMMENT
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seen	¹ ABLIKIM	24BH	BES3	$e^+ e^- \rightarrow D^+ D^-$
seen	AUBERT	09M	BABR	$e^+ e^- \rightarrow D^+ D^- \gamma$
seen	CRONIN-HEN..09	CLEO		$e^+ e^- \rightarrow D^+ D^-$
seen	PAKHLOVA	08	BELL	$e^+ e^- \rightarrow D^+ D^- \gamma$

¹ A precision measurement of the $e^+ e^- \rightarrow D^+ D^-$ cross section shows complex structure in this mass region.

$\Gamma(D\bar{D})/\Gamma(D^*\bar{D} + \text{c.c.})$ Γ_2/Γ_5

VALUE	DOCUMENT ID	TECN	COMMENT
0.24 ± 0.05 ± 0.12	AUBERT	09M BABR	$e^+e^- \rightarrow \gamma D^{(*)}\bar{D}$

 $\Gamma(D^0\bar{D}^0)/\Gamma(D^*(2007)^0\bar{D}^0 + \text{c.c.})$ Γ_3/Γ_6

VALUE	DOCUMENT ID	TECN	COMMENT
0.05 ± 0.03	¹ GOLDHABER 77	MRK1	e^+e^-

¹ Phase-space factor (p^3) explicitly removed. $\Gamma(D^*(2007)^0\bar{D}^0 + \text{c.c.})/\Gamma_{\text{total}}$ Γ_6/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
seen	AUBERT	09M BABR	$e^+e^- \rightarrow D^{*0}\bar{D}^0\gamma$
seen	CRONIN-HEN..09	CLEO	$e^+e^- \rightarrow D^{*0}\bar{D}^0$

 $\Gamma(D^*(2010)^+D^- + \text{c.c.})/\Gamma_{\text{total}}$ Γ_7/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
seen	¹ ZHUKOVA 18	BELL	$e^+e^- \rightarrow D^{*+}D^-\gamma$
seen	AUBERT	09M BABR	$e^+e^- \rightarrow D^{*+}D^-\gamma$
seen	CRONIN-HEN..09	CLEO	$e^+e^- \rightarrow D^{*+}D^-$

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

seen	PAKHLOVA 07	BELL	$e^+e^- \rightarrow D^{*+}D^-\gamma$
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¹ Supersedes PAKHLOVA 07. $\Gamma(D^*(2010)^+D^- + \text{c.c.})/\Gamma(D^*(2007)^0\bar{D}^0 + \text{c.c.})$ Γ_7/Γ_6

VALUE	DOCUMENT ID	TECN	COMMENT
0.95 ± 0.09 ± 0.10	AUBERT	09M BABR	$e^+e^- \rightarrow \gamma D^*\bar{D}$

 $\Gamma(D^*\bar{D}^*)/\Gamma(D^*\bar{D} + \text{c.c.})$ Γ_8/Γ_5

VALUE	DOCUMENT ID	TECN	COMMENT
0.18 ± 0.14 ± 0.03	AUBERT	09M BABR	$e^+e^- \rightarrow \gamma D^{(*)}\bar{D}^{(*)}$

 $\Gamma(D^*(2007)^0\bar{D}^*(2007)^0)/\Gamma_{\text{total}}$ Γ_9/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
seen	AUBERT	09M BABR	$e^+e^- \rightarrow D^{*0}\bar{D}^{*0}\gamma$
seen	CRONIN-HEN..09	CLEO	$e^+e^- \rightarrow D^{*0}\bar{D}^{*0}$

 $\Gamma(D^*(2007)^0\bar{D}^*(2007)^0)/\Gamma(D^*(2007)^0\bar{D}^0 + \text{c.c.})$ Γ_9/Γ_6

VALUE	DOCUMENT ID	TECN	COMMENT
32.0 ± 12.0	¹ GOLDHABER 77	MRK1	e^+e^-

¹ Phase-space factor (p^3) explicitly removed. $\Gamma(D^*(2010)^+D^*(2010)^-)/\Gamma_{\text{total}}$ Γ_{10}/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
seen	¹ ZHUKOVA 18	BELL	$e^+e^- \rightarrow D^{*+}D^{*-}\gamma$
seen	AUBERT	09M BABR	$e^+e^- \rightarrow D^{*+}D^{*-}\gamma$
seen	CRONIN-HEN..09	CLEO	$e^+e^- \rightarrow D^{*+}D^{*-}$

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

seen	PAKHLOVA 07	BELL	$e^+e^- \rightarrow D^{*+}D^{*-}\gamma$
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¹ Supersedes PAKHLOVA 07.

$\Gamma(D^0 D^- \pi^+ + \text{c.c. (excl. } D^*(2010)^+ D^- + \text{c.c.)})/\Gamma_{\text{total}}$ Γ_{12}/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
not seen	PAKHLOVA 08A	BELL	$e^+ e^- \rightarrow D^0 D^- \pi^+ \gamma$

$\Gamma(D \bar{D}^* \pi (\text{excl. } D^* \bar{D}^*))/\Gamma_{\text{total}}$ Γ_{13}/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
not seen	CRONIN-HEN..09	CLEO	$e^+ e^- \rightarrow D \bar{D}^* \pi$

$\Gamma(D^0 \bar{D}^{*-} \pi^+ + \text{c.c. (excl. } D^*(2010)^+ D^*(2010)^-))/\Gamma_{\text{total}}$ Γ_{14}/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
seen	PAKHLOVA 09	BELL	$e^+ e^- \rightarrow D^0 D^{*-} \pi^+ \gamma$

$\Gamma(D_s^+ D_s^-)/\Gamma_{\text{total}}$ Γ_{15}/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
seen	PAKHLOVA 11	BELL	$e^+ e^- \rightarrow D_s^+ D_s^- \gamma$
seen	DEL-AMO-SA..10N	BABR	$e^+ e^- \rightarrow D_s^+ D_s^- \gamma$
seen	CRONIN-HEN..09	CLEO	$e^+ e^- \rightarrow D_s^+ D_s^-$

$\Gamma(\pi^+ \pi^+ \pi^- \pi^- \pi^0)/\Gamma_{\text{total}}$ Γ_{16}/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

$(3.51 \pm 1.89 \pm 1.24) \times 10^{-5}$	¹ ABLIKIM	21AW BES3	$e^+ e^- \rightarrow 2\pi^+ 2\pi^- \pi^0$
$(2.41 \pm 0.05 \pm 0.79) \times 10^{-2}$	² ABLIKIM	21AW BES3	$e^+ e^- \rightarrow 2\pi^+ 2\pi^- \pi^0$

¹ Solution 1 of two solutions with equal fit quality. The significance of the $\psi(4040)$ signal is 3.6σ .

² Solution 2 of two solutions with equal fit quality. The significance of the $\psi(4040)$ signal is 3.6σ .

$\Gamma(J/\psi \pi^+ \pi^-)/\Gamma_{\text{total}}$ Γ_{18}/Γ

VALUE (units 10^{-3})	CL%	DOCUMENT ID	TECN	COMMENT
<4	90	COAN 06	CLEO	$3.97\text{--}4.06 e^+ e^- \rightarrow \text{hadrons}$

$\Gamma(J/\psi \pi^0 \pi^0)/\Gamma_{\text{total}}$ Γ_{19}/Γ

VALUE (units 10^{-3})	CL%	DOCUMENT ID	TECN	COMMENT
<2	90	COAN 06	CLEO	$3.97\text{--}4.06 e^+ e^- \rightarrow \text{hadrons}$

$\Gamma(J/\psi \eta)/\Gamma_{\text{total}}$ Γ_{20}/Γ

VALUE (units 10^{-3})	CL%	DOCUMENT ID	TECN	COMMENT
$5.2 \pm 0.5 \pm 0.5$		¹ ABLIKIM 12K	BES3	$e^+ e^- \rightarrow \ell^+ \ell^- 2\gamma$

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

<7	90	COAN 06	CLEO	$3.97\text{--}4.06 e^+ e^- \rightarrow \text{hadrons}$
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¹ ABLIKIM 12K measure $\sigma(e^+ e^- \rightarrow J/\psi \eta) = 32.1 \pm 2.8 \pm 1.3 \text{ pb}$. They assume the $\eta J/\psi$ fully originates from $\psi(4040)$ decays. Also see ABLIKIM 24T.

$\Gamma(J/\psi \pi^0)/\Gamma_{\text{total}}$ Γ_{21}/Γ

VALUE (units 10^{-3})	CL%	DOCUMENT ID	TECN	COMMENT
<0.28	90	¹ ABLIKIM 12K	BES3	$e^+ e^- \rightarrow \ell^+ \ell^- 2\gamma$

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

<2 90 COAN 06 CLEO 3.97–4.06 $e^+e^- \rightarrow$ hadrons
¹ ABLIKIM 12K measure $\sigma(e^+e^- \rightarrow J/\psi\pi^0) < 1.6$ pb. They assume the $\eta J/\psi$ fully originates from $\psi(4040)$ decays.

$\Gamma(J/\psi\pi^+\pi^-\pi^0)/\Gamma_{\text{total}}$ **Γ_{22}/Γ**

VALUE (units 10^{-3})	CL%	DOCUMENT ID	TECN	COMMENT
<2	90	COAN	06	CLEO 3.97–4.06 $e^+e^- \rightarrow$ hadrons

$\Gamma(\chi_{c1}\gamma)/\Gamma_{\text{total}}$ **Γ_{23}/Γ**

VALUE (units 10^{-3})	CL%	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

<11 90 COAN 06 CLEO 3.97–4.06 $e^+e^- \rightarrow$ hadrons

$\Gamma(\chi_{c2}\gamma)/\Gamma_{\text{total}}$ **Γ_{24}/Γ**

VALUE (units 10^{-3})	CL%	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

<17 90 COAN 06 CLEO 3.97–4.06 $e^+e^- \rightarrow$ hadrons

$\Gamma(\chi_{c1}\pi^+\pi^-\pi^0)/\Gamma_{\text{total}}$ **Γ_{25}/Γ**

VALUE (units 10^{-3})	CL%	DOCUMENT ID	TECN	COMMENT
<11	90	COAN	06	CLEO 3.97–4.06 $e^+e^- \rightarrow$ hadrons

$\Gamma(\chi_{c2}\pi^+\pi^-\pi^0)/\Gamma_{\text{total}}$ **Γ_{26}/Γ**

VALUE (units 10^{-3})	CL%	DOCUMENT ID	TECN	COMMENT
<32	90	COAN	06	CLEO 3.97–4.06 $e^+e^- \rightarrow$ hadrons

$\Gamma(h_c(1P)\pi^+\pi^-)/\Gamma_{\text{total}}$ **Γ_{27}/Γ**

VALUE (units 10^{-3})	CL%	DOCUMENT ID	TECN	COMMENT
<3	90	¹ PEDLAR	11	CLEO $e^+e^- \rightarrow h_c(1P)\pi^+\pi^-$

¹ From several values of \sqrt{s} near the peak of the $\psi(4040)$, PEDLAR 11 measures $\sigma(e^+e^- \rightarrow h_c(1P)\pi^+\pi^-) = 1.0 \pm 8.0 \pm 5.4 \pm 0.2$ pb, where the errors are statistical, systematic, and due to uncertainty in $B(\psi(2S) \rightarrow \pi^0 h_c(1P))$, respectively.

$\Gamma(\phi\pi^+\pi^-)/\Gamma_{\text{total}}$ **Γ_{28}/Γ**

VALUE (units 10^{-3})	CL%	DOCUMENT ID	TECN	COMMENT
<3	90	COAN	06	CLEO 3.97–4.06 $e^+e^- \rightarrow$ hadrons

$\Gamma(\Lambda\bar{\Lambda}\pi^+\pi^-)/\Gamma_{\text{total}}$ **Γ_{29}/Γ**

VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT
<2.9	90	¹ ABLIKIM	13Q	BES3 $e^+e^- \rightarrow \psi(4040)$

¹ Assuming that interference effects between resonance and continuum can be neglected.

$\Gamma(\Lambda\bar{\Lambda}\pi^0)/\Gamma_{\text{total}}$ **Γ_{30}/Γ**

VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT
<0.9	90	¹ ABLIKIM	13Q	BES3 $e^+e^- \rightarrow \psi(4040)$

¹ Assuming that interference effects between resonance and continuum can be neglected.

$\Gamma(\Lambda\bar{\Lambda}\eta)/\Gamma_{\text{total}}$ Γ_{31}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT
<3.0	90	¹ ABLIKIM	13Q	BES3 $e^+e^- \rightarrow \psi(4040)$

¹ Assuming that interference effects between resonance and continuum can be neglected.

$\Gamma(\Sigma^+\bar{\Sigma}^-)/\Gamma_{\text{total}}$ Γ_{33}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT
<1.3	90	¹ ABLIKIM	13Q	BES3 $e^+e^- \rightarrow \psi(4040)$

¹ Assuming that interference effects between resonance and continuum can be neglected.

$\Gamma(\Sigma^0\bar{\Sigma}^0)/\Gamma_{\text{total}}$ Γ_{34}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT
<0.7	90	¹ ABLIKIM	13Q	BES3 $e^+e^- \rightarrow \psi(4040)$

¹ Assuming that interference effects between resonance and continuum can be neglected.

$\Gamma(\Xi^+\bar{\Xi}^-)/\Gamma_{\text{total}}$ Γ_{35}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT
<1.6	90	¹ ABLIKIM	13Q	BES3 $e^+e^- \rightarrow \psi(4040)$

¹ Assuming that interference effects between resonance and continuum can be neglected.

$\Gamma(\Xi^0\bar{\Xi}^0)/\Gamma_{\text{total}}$ Γ_{36}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT
<1.8	90	¹ ABLIKIM	13Q	BES3 $e^+e^- \rightarrow \psi(4040)$

¹ Assuming that interference effects between resonance and continuum can be neglected.

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