NODE=M072

# $\psi(4040)$ [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.

LINKAGE=MPD

## $\psi(4040)$ MASS

NODE=M072M

NODE=M072M

| 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 | $e^+e^-$ |

OCCUR=2

[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 $\delta = (130 \pm 46)^\circ$.

NODE=M072M;LINKAGE=AB

[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.

NODE=M072M;LINKAGE=MO

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

NODE=M072M;LINKAGE=ST

[4] From a fit to BES (BAI 02C) data.

NODE=M072M;LINKAGE=SE

## $\psi(4040)$ WIDTH

NODE=M072W

NODE=M072W

| 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 | $e^+e^-$ |

OCCUR=2

[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 $\delta = (130 \pm 46)^\circ$.

NODE=M072W;LINKAGE=AB

[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.

NODE=M072W;LINKAGE=MO

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

NODE=M072W;LINKAGE=ST

[4] From a fit to BES (BAI 02C) data.

NODE=M072W;LINKAGE=SE

## $\psi(4040)$ DECAY MODES

NODE=M072215;NODE=M072

Due to the complexity of the $c\overline{c}$ 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 $2\sigma$ above zero, without regard to any peaking behavior in $\sqrt{s}$ or absence thereof. See mode listing(s) for details and references.

NODE=M072

| | Mode | Fraction ($\Gamma_i/\Gamma$) | Confidence level | |
|---|---|---|---|---|
| $\Gamma_1$ | $e^+e^-$ | $(1.02\pm0.17) \times 10^{-5}$ | | DESIG=5 |
| $\Gamma_2$ | $D\overline{D}$ | seen | | DESIG=17;OUR EST;→ UNCHECKED ← |
| $\Gamma_3$ | $D^0\overline{D}^0$ | seen | | DESIG=1 |
| $\Gamma_4$ | $D^+D^-$ | seen | | DESIG=18 |
| $\Gamma_5$ | $D^*\overline{D}$+ c.c. | seen | | DESIG=19;OUR EST;→ UNCHECKED ← |
| $\Gamma_6$ | $D^*(2007)^0\overline{D}^0$ + c.c. | seen | | DESIG=2 |
| $\Gamma_7$ | $D^*(2010)^+D^-$ + c.c. | seen | | DESIG=20 |
| $\Gamma_8$ | $D^*\overline{D}^*$ | seen | | DESIG=21;OUR EST;→ UNCHECKED ← |
| $\Gamma_9$ | $D^*(2007)^0\overline{D}^*(2007)^0$ | seen | | DESIG=3 |
| $\Gamma_{10}$ | $D^*(2010)^+D^*(2010)^-$ | seen | | DESIG=22 |

| | | | | | |
|---|---|---|---|---|---|
| $\Gamma_{11}$ | $D\overline{D}\pi$ (excl. $D^*\overline{D}$) | not seen | | | DESIG=23;OUR EST;→ UNCHECKED ← |
| $\Gamma_{12}$ | $D^0 D^- \pi^+$ +c.c. (excl. $D^*(2010)^+ D^-$ +c.c.) | not seen | | | DESIG=24 |
| $\Gamma_{13}$ | $D\overline{D}^*\pi$ (excl. $D^*\overline{D}^*$) | not seen | | | DESIG=25 |
| $\Gamma_{14}$ | $D^0 \overline{D}^{*-} \pi^+$ +c.c. (excl. $D^*(2010)^+ D^*(2010)^-$) | seen | | | DESIG=26 |
| $\Gamma_{15}$ | $D_s^+ D_s^-$ | seen | | | DESIG=27 |
| $\Gamma_{16}$ | $\pi^+\pi^+\pi^-\pi^-\pi^0$ | seen | | | DESIG=37;OUR EST;→ UNCHECKED ← |
| $\Gamma_{17}$ | $J/\psi(1S)$ hadrons | seen | | | DESIG=4;OUR EST;→ UNCHECKED ← |
| $\Gamma_{18}$ | $J/\psi\pi^+\pi^-$ | $< 4$ | $\times 10^{-3}$ | 90% | DESIG=7 |
| $\Gamma_{19}$ | $J/\psi\pi^0\pi^0$ | $< 2$ | $\times 10^{-3}$ | 90% | DESIG=8 |
| $\Gamma_{20}$ | $J/\psi\eta$ | $(5.2 \pm 0.7)$ | $\times 10^{-3}$ | | DESIG=9 |
| $\Gamma_{21}$ | $J/\psi\pi^0$ | $< 2.8$ | $\times 10^{-4}$ | 90% | DESIG=10 |
| $\Gamma_{22}$ | $J/\psi\pi^+\pi^-\pi^0$ | $< 2$ | $\times 10^{-3}$ | 90% | DESIG=11 |
| $\Gamma_{23}$ | $\chi_{c1}\gamma$ | $< 3.4$ | $\times 10^{-3}$ | 90% | DESIG=12 |
| $\Gamma_{24}$ | $\chi_{c2}\gamma$ | $< 5$ | $\times 10^{-3}$ | 90% | DESIG=13 |
| $\Gamma_{25}$ | $\chi_{c1}\pi^+\pi^-\pi^0$ | $< 1.1$ | % | 90% | DESIG=14 |
| $\Gamma_{26}$ | $\chi_{c2}\pi^+\pi^-\pi^0$ | $< 3.2$ | % | 90% | DESIG=15 |
| $\Gamma_{27}$ | $h_c(1P)\pi^+\pi^-$ | $< 3$ | $\times 10^{-3}$ | 90% | DESIG=28 |
| $\Gamma_{28}$ | $\phi\pi^+\pi^-$ | $< 3$ | $\times 10^{-3}$ | 90% | DESIG=16 |
| $\Gamma_{29}$ | $\Lambda\overline{\Lambda}\pi^+\pi^-$ | $< 2.9$ | $\times 10^{-4}$ | 90% | DESIG=29 |
| $\Gamma_{30}$ | $\Lambda\overline{\Lambda}\pi^0$ | $< 9$ | $\times 10^{-5}$ | 90% | DESIG=30 |
| $\Gamma_{31}$ | $\Lambda\overline{\Lambda}\eta$ | $< 3.0$ | $\times 10^{-4}$ | 90% | DESIG=31 |
| $\Gamma_{32}$ | $\Lambda\overline{\Lambda}$ | $< 6$ | $\times 10^{-6}$ | 90% | DESIG=36 |
| $\Gamma_{33}$ | $\Sigma^+\overline{\Sigma}^-$ | $< 1.3$ | $\times 10^{-4}$ | 90% | DESIG=32 |
| $\Gamma_{34}$ | $\Sigma^0\overline{\Sigma}^0$ | $< 7$ | $\times 10^{-5}$ | 90% | DESIG=33 |
| $\Gamma_{35}$ | $\Xi^+\overline{\Xi}^-$ | $< 1.6$ | $\times 10^{-4}$ | 90% | DESIG=34 |
| $\Gamma_{36}$ | $\Xi^0\overline{\Xi}^0$ | $< 1.8$ | $\times 10^{-4}$ | 90% | DESIG=35 |
| $\Gamma_{37}$ | $\Xi^-\overline{\Xi}^+$ | $< 6$ | $\times 10^{-5}$ | 90% | DESIG=38 |
| $\Gamma_{38}$ | $\Lambda\overline{\Xi}^+ K^-$ + c.c. | $< 7$ | $\times 10^{-5}$ | 90% | DESIG=39 |
| $\Gamma_{39}$ | $\Sigma^0\overline{\Xi}^+ K^-$ + c.c. | $< 1.5$ | $\times 10^{-5}$ | 90% | DESIG=40 |
| $\Gamma_{40}$ | $p K^- K^- \overline{\Xi}^+$ + c.c. | $< 4$ | $\times 10^{-5}$ | 90% | DESIG=41 |
| $\Gamma_{41}$ | $\mu^+\mu^-$ | $(9 \pm 6)$ | $\times 10^{-6}$ | | DESIG=6 |

## $\psi(4040)$ PARTIAL WIDTHS

NODE=M072220

### $\Gamma(e^+e^-)$ $\Gamma_1$

NODE=M072W5
NODE=M072W5

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

→ UNCHECKED ←

OCCUR=2

[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 $\delta = (130 \pm 46)^\circ$.

NODE=M072W5;LINKAGE=AB

[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.

NODE=M072W5;LINKAGE=MO

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

NODE=M072W5;LINKAGE=ST

[4] From a fit to BES (BAI 02C) data.

NODE=M072W5;LINKAGE=SE

### $\Gamma(\mu^+\mu^-)$ $\Gamma_{41}$

NODE=M072W2
NODE=M072W2

| VALUE (keV) | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|
| **0.73±0.48±0.12** | [1,2] ABLIKIM | 20AG | BES3 | $e^+e^- \to \mu^+\mu^-$ |

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

NODE=M072W2;LINKAGE=A

[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.

NODE=M072W2;LINKAGE=B

## $\psi(4040)$ $\Gamma(i) \times \Gamma(e^+e^-)/\Gamma(total)$

NODE=M072235

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

NODE=M072R00
NODE=M072R00

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

| VALUE (eV) | DOCUMENT ID | | TECN | COMMENT | |
|---|---|---|---|---|---|
| $1.0\pm0.2\pm0.1$ | [1] ABLIKIM | 24T | BES3 | $e^+e^- \rightarrow \eta J/\psi$ | |
| $7.1\pm0.6\pm0.9$ | [2] ABLIKIM | 24T | BES3 | $e^+e^- \rightarrow \eta J/\psi$ | OCCUR=2 |
| $1.1\pm0.2\pm0.2$ | [3] ABLIKIM | 24T | BES3 | $e^+e^- \rightarrow \eta J/\psi$ | OCCUR=3 |
| $7.8\pm0.6\pm1.1$ | [4] ABLIKIM | 24T | BES3 | $e^+e^- \rightarrow \eta J/\psi$ | OCCUR=4 |
| $1.5\pm0.3$ | [5] ABLIKIM | 20O | BES3 | $e^+e^- \rightarrow \eta J/\psi$ | |
| $1.4\pm0.3$ | [6] ABLIKIM | 20O | BES3 | $e^+e^- \rightarrow \eta J/\psi$ | OCCUR=2 |
| $7.0\pm0.6$ | [7] ABLIKIM | 20O | BES3 | $e^+e^- \rightarrow \eta J/\psi$ | OCCUR=3 |

[1] Solution 1 of 4. Supersedes ABLIKIM 20O. NODE=M072R00;LINKAGE=D
[2] Solution 2 of 4. Supersedes ABLIKIM 20O. NODE=M072R00;LINKAGE=E
[3] Solution 3 of 4. Supersedes ABLIKIM 20O. NODE=M072R00;LINKAGE=F
[4] Solution 4 of 4. Supersedes ABLIKIM 20O. NODE=M072R00;LINKAGE=G
[5] Solution 1 of three equivalent fit solutions using three resonant structures. NODE=M072R00;LINKAGE=A
[6] Solution 2 of three equivalent fit solutions using three resonant structures. NODE=M072R00;LINKAGE=B
[7] Solution 3 of three equivalent fit solutions using three resonant structures. NODE=M072R00;LINKAGE=C

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

NODE=M072G01
NODE=M072G01

| 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 ± 0.21)%. NODE=M072G01;LINKAGE=A

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

NODE=M072G02
NODE=M072G02

| 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 ± 0.21)%. NODE=M072G02;LINKAGE=A

### $\Gamma(\Lambda\overline{\Lambda}) \times \Gamma(e^+e^-)/\Gamma_{total}$ — $\Gamma_{32}\Gamma_1/\Gamma$

NODE=M072R33
NODE=M072R33

| VALUE (eV) | CL% | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **$<5.5 \times 10^{-3}$** | 90 | [1] ABLIKIM | 21AS | BES3 | $e^+e^- \rightarrow \psi(4040)$ |

[1] From a measurement of the $e^+e^- \rightarrow \Lambda\overline{\Lambda}$ cross section between 3.5 and 4.6 GeV. NODE=M072R33;LINKAGE=A

### $\Gamma(\Sigma^+\overline{\Sigma}^-) \times \Gamma(e^+e^-)/\Gamma_{total}$ — $\Gamma_{33}\Gamma_1/\Gamma$

NODE=M072R37
NODE=M072R37

| VALUE (eV) | CL% | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **$<216.6 \times 10^{-3}$** | 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=M072R37;LINKAGE=A

### $\Gamma(\Sigma^0\overline{\Sigma}^0) \times \Gamma(e^+e^-)/\Gamma_{total}$ — $\Gamma_{34}\Gamma_1/\Gamma$

NODE=M072R41
NODE=M072R41

| VALUE (eV) | CL% | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **$<66.1 \times 10^{-3}$** | 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=M072R41;LINKAGE=A

### $\Gamma(\Xi^0\overline{\Xi}^0) \times \Gamma(e^+e^-)/\Gamma_{total}$ — $\Gamma_{36}\Gamma_1/\Gamma$

NODE=M072R40
NODE=M072R40

| VALUE (eV) | CL% | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **$<83.4 \times 10^{-3}$** | 90 | [1] ABLIKIM | 24CD | BES3 | $e^+e^- \rightarrow \psi(4040)$ |

[1] From a fit to $e^+e^- \rightarrow \Xi^0\overline{\Xi}^0$ cross sections. NODE=M072R40;LINKAGE=A

### $\Gamma(\Xi^-\overline{\Xi}^+) \times \Gamma(e^+e^-)/\Gamma_{total}$ — $\Gamma_{37}\Gamma_1/\Gamma$

NODE=M072R35
NODE=M072R35

| VALUE (eV) | CL% | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **$<51.9 \times 10^{-3}$** | 90 | [1] ABLIKIM | 23BK | BES3 | $e^+e^- \rightarrow \psi(4040)$ |

[1] From a fit to $e^+e^- \rightarrow \Xi^-\overline{\Xi}^+$ cross sections. NODE=M072R35;LINKAGE=A

### $\Gamma(\Lambda\overline{\Xi}^+K^- + c.c.) \times \Gamma(e^+e^-)/\Gamma_{total}$ — $\Gamma_{38}\Gamma_1/\Gamma$

NODE=M072R38
NODE=M072R38

| VALUE (eV) | CL% | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **$<62.0 \times 10^{-3}$** | 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=M072R38;LINKAGE=A

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

NODE=M072R39
NODE=M072R39

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

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

NODE=M072R39;LINKAGE=A

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

NODE=M072R42
NODE=M072R42

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

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

NODE=M072230

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

NODE=M072R25
NODE=M072R25

| VALUE (units $10^{-8}$) | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | |
| $5.1 \pm 1.4 \pm 1.5$ | [1] WANG | 13B | BELL | $e^+ e^- \to J/\psi \eta \gamma$ |
| $12.8 \pm 2.1 \pm 1.9$ | [2] WANG | 13B | BELL | $e^+ e^- \to J/\psi \eta \gamma$ |

OCCUR=2

[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.

NODE=M072R25;LINKAGE=A

[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.

NODE=M072R25;LINKAGE=B

## $\psi(4040)$ BRANCHING RATIOS

NODE=M072225

### $\Gamma(e^+ e^-)/\Gamma_{total}$ — $\Gamma_1/\Gamma$

NODE=M072R4
NODE=M072R4

| VALUE (units $10^{-5}$) | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | |
| $\sim 1.0$ | FELDMAN | 77 | MRK1 | $e^+ e^-$ |

### $\Gamma(D^0 \overline{D}^0)/\Gamma_{total}$ — $\Gamma_3/\Gamma$

NODE=M072R14
NODE=M072R14

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

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

NODE=M072R14;LINKAGE=A

### $\Gamma(D^+ D^-)/\Gamma_{total}$ — $\Gamma_4/\Gamma$

NODE=M072R15
NODE=M072R15

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

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

NODE=M072R15;LINKAGE=A

### $\Gamma(D \overline{D})/\Gamma(D^* \overline{D} + c.c.)$ — $\Gamma_2/\Gamma_5$

NODE=M072R12
NODE=M072R12

| VALUE | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|
| **$0.24 \pm 0.05 \pm 0.12$** | AUBERT | 09M | BABR | $e^+ e^- \to \gamma D^{(*)} \overline{D}$ |

### $\Gamma(D^0 \overline{D}^0)/\Gamma(D^*(2007)^0 \overline{D}^0 + c.c.)$ — $\Gamma_3/\Gamma_6$

NODE=M072R1
NODE=M072R1

| VALUE | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|
| **$0.05 \pm 0.03$** | [1] GOLDHABER | 77 | MRK1 | $e^+ e^-$ |

[1] Phase-space factor ($p^3$) explicitly removed.

NODE=M072R;LINKAGE=P

### $\Gamma(D^*(2007)^0 \overline{D}^0 + c.c.)/\Gamma_{total}$ — $\Gamma_6/\Gamma$

NODE=M072R16
NODE=M072R16

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

### $\Gamma(D^*(2010)^+ D^- + \text{c.c.})/\Gamma_{\text{total}}$ $\Gamma_7/\Gamma$

NODE=M072R17
NODE=M072R17

| VALUE | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|
| **seen** | [1] ZHUKOVA | 18 | BELL | $e^+ e^- \to D^{*+} D^- \gamma$ |
| **seen** | AUBERT | 09M | BABR | $e^+ e^- \to D^{*+} D^- \gamma$ |
| **seen** | CRONIN-HEN... | 09 | CLEO | $e^+ e^- \to D^{*+} D^-$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | |
| seen | PAKHLOVA | 07 | BELL | $e^+ e^- \to D^{*+} D^- \gamma$ |

OCCUR=3

[1] Supersedes PAKHLOVA 07.

NODE=M072R17;LINKAGE=C

### $\Gamma(D^*(2010)^+ D^- + \text{c.c.})/\Gamma(D^*(2007)^0 \overline{D}^0 + \text{c.c.})$ $\Gamma_7/\Gamma_6$

NODE=M072R11
NODE=M072R11

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

### $\Gamma(D^* \overline{D}^*)/\Gamma(D^* \overline{D} + \text{c.c.})$ $\Gamma_8/\Gamma_5$

NODE=M072R13
NODE=M072R13

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

### $\Gamma(D^*(2007)^0 \overline{D}^*(2007)^0)/\Gamma_{\text{total}}$ $\Gamma_9/\Gamma$

NODE=M072R18
NODE=M072R18

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

### $\Gamma(D^*(2007)^0 \overline{D}^*(2007)^0)/\Gamma(D^*(2007)^0 \overline{D}^0 + \text{c.c.})$ $\Gamma_9/\Gamma_6$

NODE=M072R2
NODE=M072R2

| VALUE | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|
| **32.0±12.0** | [1] GOLDHABER | 77 | MRK1 | $e^+ e^-$ |

[1] Phase-space factor ($p^3$) explicitly removed.

NODE=M072R2;LINKAGE=P

### $\Gamma(D^*(2010)^+ D^*(2010)^-)/\Gamma_{\text{total}}$ $\Gamma_{10}/\Gamma$

NODE=M072R19
NODE=M072R19

| VALUE | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|
| **seen** | [1] ZHUKOVA | 18 | BELL | $e^+ e^- \to D^{*+} D^{*-} \gamma$ |
| **seen** | AUBERT | 09M | BABR | $e^+ e^- \to D^{*+} D^{*-} \gamma$ |
| **seen** | CRONIN-HEN... | 09 | CLEO | $e^+ e^- \to D^{*+} D^{*-}$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | |
| seen | PAKHLOVA | 07 | BELL | $e^+ e^- \to D^{*+} D^{*-} \gamma$ |

OCCUR=2

[1] Supersedes PAKHLOVA 07.

NODE=M072R19;LINKAGE=B

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

NODE=M072R20
NODE=M072R20

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

### $\Gamma(D \overline{D}^* \pi (\text{excl. } D^* \overline{D}^*))/\Gamma_{\text{total}}$ $\Gamma_{13}/\Gamma$

NODE=M072R21
NODE=M072R21

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

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

NODE=M072R22
NODE=M072R22

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

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

NODE=M072R23
NODE=M072R23

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

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

NODE=M072R34
NODE=M072R34

| VALUE | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|
| • • • 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 | $e^+ e^- \to 2\pi^+ 2\pi^- \pi^0$ |
| $(2.41 \pm 0.05 \pm 0.79) \times 10^{-2}$ | [2] ABLIKIM | 21AW | BES3 | $e^+ e^- \to 2\pi^+ 2\pi^- \pi^0$ |

OCCUR=2

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

NODE=M072R34;LINKAGE=A

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

NODE=M072R34;LINKAGE=B

### $\Gamma(J/\psi\pi^+\pi^-)/\Gamma_{total}$ — $\Gamma_{18}/\Gamma$

NODE=M072R01
NODE=M072R01

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

### $\Gamma(J/\psi\pi^0\pi^0)/\Gamma_{total}$ — $\Gamma_{19}/\Gamma$

NODE=M072R02
NODE=M072R02

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

### $\Gamma(J/\psi\eta)/\Gamma_{total}$ — $\Gamma_{20}/\Gamma$

NODE=M072R03
NODE=M072R03

| *VALUE* (units $10^{-3}$) | *CL%* | *DOCUMENT ID* | | *TECN* | *COMMENT* |
|---|---|---|---|---|---|
| **5.2±0.5±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 | 3.97–4.06 $e^+e^- \rightarrow$ hadrons |

[1] ABLIKIM 12K measure $\sigma(e^+e^- \rightarrow J/\psi\eta) = 32.1 \pm 2.8 \pm 1.3$ pb. They assume the $\eta J/\psi$ fully originates from $\psi(4040)$ decays. Also see ABLIKIM 24T.

NODE=M072R03;LINKAGE=AB

### $\Gamma(J/\psi\pi^0)/\Gamma_{total}$ — $\Gamma_{21}/\Gamma$

NODE=M072R04
NODE=M072R04

| *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.

NODE=M072R04;LINKAGE=AB

### $\Gamma(J/\psi\pi^+\pi^-\pi^0)/\Gamma_{total}$ — $\Gamma_{22}/\Gamma$

NODE=M072R05
NODE=M072R05

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

### $\Gamma(\chi_{c1}\gamma)/\Gamma_{total}$ — $\Gamma_{23}/\Gamma$

NODE=M072R06
NODE=M072R06

| *VALUE* (units $10^{-3}$) | *CL%* | *DOCUMENT ID* | | *TECN* | *COMMENT* |
|---|---|---|---|---|---|
| • • • 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 |

### $\Gamma(\chi_{c2}\gamma)/\Gamma_{total}$ — $\Gamma_{24}/\Gamma$

NODE=M072R07
NODE=M072R07

| *VALUE* (units $10^{-3}$) | *CL%* | *DOCUMENT ID* | | *TECN* | *COMMENT* |
|---|---|---|---|---|---|
| • • • 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 |

### $\Gamma(\chi_{c1}\pi^+\pi^-\pi^0)/\Gamma_{total}$ — $\Gamma_{25}/\Gamma$

NODE=M072R08
NODE=M072R08

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

### $\Gamma(\chi_{c2}\pi^+\pi^-\pi^0)/\Gamma_{total}$ — $\Gamma_{26}/\Gamma$

NODE=M072R09
NODE=M072R09

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

### $\Gamma(h_c(1P)\pi^+\pi^-)/\Gamma_{total}$ — $\Gamma_{27}/\Gamma$

NODE=M072R24
NODE=M072R24

| *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.

NODE=M072R24;LINKAGE=PE

### $\Gamma(\phi\pi^+\pi^-)/\Gamma_{total}$ — $\Gamma_{28}/\Gamma$

NODE=M072R10
NODE=M072R10

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

### $\Gamma(\Lambda\overline{\Lambda}\pi^+\pi^-)/\Gamma_{total}$ — $\Gamma_{29}/\Gamma$

NODE=M072R26
NODE=M072R26

| *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.

NODE=M072R26;LINKAGE=A

### $\Gamma(\Lambda\bar{\Lambda}\pi^0)/\Gamma_{total}$ $\Gamma_{30}/\Gamma$

NODE=M072R27
NODE=M072R27

| *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.

NODE=M072R27;LINKAGE=A

### $\Gamma(\Lambda\bar{\Lambda}\eta)/\Gamma_{total}$ $\Gamma_{31}/\Gamma$

NODE=M072R28
NODE=M072R28

| *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.

NODE=M072R28;LINKAGE=A

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

NODE=M072R29
NODE=M072R29

| *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.

NODE=M072R29;LINKAGE=A

### $\Gamma(\Sigma^0\bar{\Sigma}^0)/\Gamma_{total}$ $\Gamma_{34}/\Gamma$

NODE=M072R30
NODE=M072R30

| *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.

NODE=M072R30;LINKAGE=A

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

NODE=M072R31
NODE=M072R31

| *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.

NODE=M072R31;LINKAGE=A

### $\Gamma(\Xi^0\bar{\Xi}^0)/\Gamma_{total}$ $\Gamma_{36}/\Gamma$

NODE=M072R32
NODE=M072R32

| *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.

NODE=M072R32;LINKAGE=A

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