Reference = ANASHIN 15; PL B749 50
Verifier code = EIDELMAN

Normally we send all verifications for one experiment to one person, usually the spokesperson or data-analysis co-ordinator, who then distributes them to the appropriate people. Please tell us if we should send the verifications for your experiment to someone else.

*PLEASE READ NOW*

*PLEASE REPLY WITHIN ONE WEEK*

Simon Eidelman

EMAIL: simon.eidelman@cern.ch

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July 21, 2016

Dear Colleague,

(1) Please check the results of your experiment carefully. They are marked.

(2) Please reply within one week.

(3) Please reply even if everything is correct.

(4) IMPORTANT!! Please tell WHICH papers you are verifying. We have lots of requests out.

(5) Feel free to make comments on our treatment of any of the results (not just yours) you see.

Thank you for helping us make the Review accurate and useful.

Sincerely,

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Prospekt Lavrent'eva 11
RU-630090 Novosibirsk
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EMAIL: simon.eidelman@cern.ch

# $c\bar{c}$ MESONS

NODE=MXXX025

NODE=M070

## $J/\psi(1S)$

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

### $J/\psi(1S)$ MASS

NODE=M070M

NODE=M070M

| VALUE (MeV) | | | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|---|---|
| **3096.900±0.006 OUR AVERAGE** | | | | | | | |
| 3096.66 | ±0.19 | ±0.02 | 6.1k | [1] AAIJ | 15BI | LHCB | $pp \to J/\psi X$ |
| YOUR DATA 3096.900 | ±0.002 | ±0.006 | | [2] ANASHIN | 15 | KEDR | $e^+e^- \to$ hadrons |
| 3096.89 | ±0.09 | | 502 | [3] ARTAMONOV | 00 | OLYA | $e^+e^- \to$ hadrons |
| 3096.91 | ±0.03 | ±0.01 | | [4] ARMSTRONG | 93B | E760 | $\bar{p}p \to e^+e^-$ |
| 3096.95 | ±0.1 | ±0.3 | 193 | BAGLIN | 87 | SPEC | $\bar{p}p \to e^+e^-X$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | | | |
| 3096.917 | ±0.010 | ±0.007 | | AULCHENKO | 03 | KEDR | $e^+e^- \to$ hadrons |
| 3097.5 | ±0.3 | | | GRIBUSHIN | 96 | FMPS | 515 $\pi^-$ Be $\to 2\mu X$ |
| 3098.4 | ±2.0 | | 38k | LEMOIGNE | 82 | GOLI | 185 $\pi^-$ Be $\to \gamma\mu^+\mu^-$ A |
| 3096.93 | ±0.09 | | 502 | [5] ZHOLENTZ | 80 | REDE | $e^+e^-$ |
| 3097.0 | ±1 | | | [6] BRANDELIK | 79C | DASP | $e^+e^-$ |

[1] From a sample of $\eta_c(1S)$ and $J/\psi$ produced in $b$-hadron decays. NODE=M070M;LINKAGE=B

YOUR NOTE

[2] Supersedes AULCHENKO 03. NODE=M070M;LINKAGE=A

[3] Reanalysis of ZHOLENTZ 80 using new electron mass (COHEN 87) and radiative corrections (KURAEV 85). NODE=M070M;LINKAGE=AR

[4] Mass central value and systematic error recalculated by us according to Eq. (16) in ARMSTRONG 93B, using the value for the $\psi(2S)$ mass from AULCHENKO 03. NODE=M070M;LINKAGE=NW

[5] Superseded by ARTAMONOV 00. NODE=M070M;LINKAGE=RZ

[6] From a simultaneous fit to $e^+e^-$, $\mu^+\mu^-$ and hadronic channels assuming $\Gamma(e^+e^-) = \Gamma(\mu^+\mu^-)$. NODE=M070M;LINKAGE=F

### $J/\psi(1S)$ REFERENCES

NODE=M070

YOUR PAPER


| | | | | |
|---|---|---|---|---|
| AAIJ | 15BI | EPJ C75 311 | R. Aaij *et al.* | (LHCb Collab.) |
| ANASHIN | 15 | PL B749 50 | V.V. Anashin *et al.* | (KEDR Collab.) |
| AULCHENKO | 03 | PL B573 63 | V.M. Aulchenko *et al.* | (KEDR Collab.) |
| ARTAMONOV | 00 | PL B474 427 | A.S. Artamonov *et al.* | |
| GRIBUSHIN | 96 | PR D53 4723 | A. Gribushin *et al.* | (E672 Collab., E706 Collab.) |
| ARMSTRONG | 93B | PR D47 772 | T.A. Armstrong *et al.* | (FNAL E760 Collab.) |
| BAGLIN | 87 | NP B286 592 | C. Baglin *et al.* | (LAPP, CERN, GENO, LYON+) |
| COHEN | 87 | RMP 59 1121 | E.R. Cohen, B.N. Taylor | (RISC, NBS) |
| KURAEV | 85 | SJNP 41 466 | E.A. Kuraev, V.S. Fadin | (NOVO) |
| | | Translated from YAF 41 733. | | |
| LEMOIGNE | 82 | PL 113B 509 | Y. Lemoigne *et al.* | (SACL, LOIC, SHMP+) |
| ZHOLENTZ | 80 | PL 96B 214 | A.A. Zholents *et al.* | (NOVO) |
| Also | | SJNP 34 814 | A.A. Zholents *et al.* | (NOVO) |
| | | Translated from YAF 34 1471. | | |
| BRANDELIK | 79C | ZPHY C1 233 | R. Brandelik *et al.* | (DASP Collab.) |


REFID=57147
REFID=56792
REFID=49579
REFID=47424
REFID=44739
REFID=43307
REFID=40002
REFID=11616
REFID=40033
REFID=22084
REFID=10320
REFID=10321
REFID=22114

NODE=M071

## $\psi(2S)$

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

See the Review on "$\psi(2S)$ and $\chi_c$ branching ratios" before the $\chi_{c0}(1P)$ Listings. NODE=M071

### $\psi(2S)$ MASS

NODE=M071M

OUR FIT includes measurements of $m_{\psi(2S)}$, $m_{\psi(3770)}$, and $m_{\psi(3770)} - m_{\psi(2S)}$. NODE=M071M

NODE=M071M

| VALUE (MeV) | | | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|---|---|
| **3686.097±0.010 OUR AVERAGE** | | | | | | | |
| YOUR DATA 3686.099 | ±0.004 | ±0.009 | | [1] ANASHIN | 15 | KEDR | $e^+e^- \to$ hadrons |
| 3686.12 | ±0.06 | ±0.10 | 4k | AAIJ | 12H | LHCB | $pp \to J/\psi\pi^+\pi^-X$ |
| 3685.95 | ±0.10 | | 413 | [2] ARTAMONOV | 00 | OLYA | $e^+e^- \to$ hadrons |
| 3685.98 | ±0.09 | ±0.04 | | [3] ARMSTRONG | 93B | E760 | $\bar{p}p \to e^+e^-$ |

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

| | | | | | | |
|---|---|---|---|---|---|---|
| $3686.114 \pm 0.007 ^{+0.011}_{-0.016}$ | | [4] ANASHIN | 12 | KEDR | $e^+e^- \to$ hadrons | |
| $3686.111 \pm 0.025 \pm 0.009$ | | AULCHENKO | 03 | KEDR | $e^+e^- \to$ hadrons | |
| $3686.00 \pm 0.10$ | 413 | [5] ZHOLENTZ | 80 | OLYA | $e^+e^-$ | |

YOUR NOTE

[1] Supersedes AULCHENKO 03 and ANASHIN 12. NODE=M071M;LINKAGE=A

[2] Reanalysis of ZHOLENTZ 80 using new electron mass (COHEN 87) and radiative corrections (KURAEV 85). NODE=M071M;LINKAGE=AR

[3] Mass central value and systematic error recalculated by us according to Eq. (16) in ARMSTRONG 93B, using the value for the $J/\psi(1S)$ mass from AULCHENKO 03. NODE=M071M;LINKAGE=NW

[4] From the scans in 2004 and 2006. ANASHIN 12 reports the value $3686.114 \pm 0.007 \pm 0.011 ^{+0.002}_{-0.012}$ MeV, where the third uncertainty is due to assumptions on the interference between the resonance and hadronic continuum. We combined the two systematic uncertainties. NODE=M071M;LINKAGE=AN

[5] Superseded by ARTAMONOV 00. NODE=M071M;LINKAGE=RZ

## $\psi(2S)$ REFERENCES

NODE=M071


YOUR PAPER

| | | | | | |
|---|---|---|---|---|---|
| ANASHIN | 15 | PL B749 50 | V.V. Anashin *et al.* | (KEDR Collab.) | REFID=56792 |
| AAIJ | 12H | EPJ C72 1972 | R. Aaij *et al.* | (LHCb Collab.) | REFID=54056 |
| ANASHIN | 12 | PL B711 280 | V.V. Anashin *et al.* | (KEDR Collab.) | REFID=54038 |
| AULCHENKO | 03 | PL B573 63 | V.M. Aulchenko *et al.* | (KEDR Collab.) | REFID=49579 |
| ARTAMONOV | 00 | PL B474 427 | A.S. Artamonov *et al.* | | REFID=47424 |
| ARMSTRONG | 93B | PR D47 772 | T.A. Armstrong *et al.* | (FNAL E760 Collab.) | REFID=43307 |
| COHEN | 87 | RMP 59 1121 | E.R. Cohen, B.N. Taylor | (RISC, NBS) | REFID=11616 |
| KURAEV | 85 | SJNP 41 466 | E.A. Kuraev, V.S. Fadin | (NOVO) | REFID=40033 |
| | | Translated from YAF 41 733. | | | |
| ZHOLENTZ | 80 | PL 96B 214 | A.A. Zholents *et al.* | (NOVO) | REFID=10320 |
| Also | | SJNP 34 814 | A.A. Zholents *et al.* | (NOVO) | REFID=10321 |
| | | Translated from YAF 34 1471. | | | |