

X(3872)

$$I^G(J^P) = ??(??)$$

OMITTED FROM SUMMARY TABLE

Seen by CHOI 03 in $B \rightarrow K \pi^+ \pi^- J/\psi(1S)$ decays as a narrow peak in the invariant mass distribution of the $\pi^+ \pi^- J/\psi(1S)$ final state, but not seen in the $\gamma \chi_{c1}$ final state of these decays. Possibly absent in the invariant mass spectrum of the final state $\pi^+ \pi^- J/\psi(1S)$ in $e^+ e^-$ collisions. Interpretation as a 1^{--} charmonium state not favored. Isovector hypothesis excluded by AUBERT 05B.

Quantum numbers are not established.

X(3872) MASS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
3871.7±0.6 OUR AVERAGE				
3871.3±0.7±0.4	730	¹ ACOSTA	04 CDF2	$p\bar{p} \rightarrow J/\psi \pi^+ \pi^- X$
3872.0±0.6±0.5	36	CHOI	03 BELL	$B \rightarrow K \pi^+ \pi^- J/\psi$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
3871.8±3.1±3.0	522	^{1,2} ABAZOV	04F D0	$p\bar{p} \rightarrow J/\psi \pi^+ \pi^- X$
¹ Width consistent with detector resolution.				
² Calculated from the corresponding $m_{X(3872)} - m_{J/\psi}$ using $m_{J/\psi} = 3096.916$ MeV.				

$m_{X(3872)^\pm} - m_{J/\psi}$

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
774.9±3.1±3.0	522	ABAZOV	04F D0	$p\bar{p} \rightarrow J/\psi \pi^+ \pi^- X$

X(3872) WIDTH

VALUE (MeV)	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
<2.3	90	36	CHOI	03 BELL	$B \rightarrow K \pi^+ \pi^- J/\psi$

X(3872) DECAY MODES

Mode	Fraction (Γ_i/Γ)
Γ_1 $e^+ e^-$	
Γ_2 $\pi^+ \pi^- J/\psi(1S)$	seen
Γ_3 $\gamma\gamma$	
Γ_4 $D^0 \bar{D}^0$	not seen
Γ_5 $D^+ D^-$	not seen
Γ_6 $D^0 \bar{D}^0 \pi^0$	not seen
Γ_7 $\gamma \chi_{c1}$	
Γ_8 $\eta J/\psi$	

X(3872) PARTIAL WIDTHS

$\Gamma(e^+e^-)$ Γ_1

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

<0.28	90	³ YUAN	04	RVUE $e^+e^- \rightarrow \pi^+\pi^- J/\psi$
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³ Using BAI 98E data on $e^+e^- \rightarrow \pi^+\pi^-\ell^+\ell^-$. Assuming that $\Gamma(\pi^+\pi^- J/\psi)$ of X(3872) is the same as that of $\psi(2S)$ (85.4 keV).

X(3872) $\Gamma(i)\Gamma(e^+e^-)/\Gamma(\text{total})$

$\Gamma(e^+e^-) \times \Gamma(\pi^+\pi^- J/\psi(1S))/\Gamma_{\text{total}}$ $\Gamma_1\Gamma_2/\Gamma$

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

< 8.3	90	⁴ DOBBS	05	CLE3 $e^+e^- \rightarrow \pi^+\pi^- J/\psi$
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<10	90	⁵ YUAN	04	RVUE $e^+e^- \rightarrow \pi^+\pi^- J/\psi$
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⁴ Assuming X(3872) has $J^{PC} = 1^{--}$.

⁵ Using BAI 98E data on $e^+e^- \rightarrow \pi^+\pi^-\ell^+\ell^-$. From theoretical calculation of the production cross section and using $B(J/\psi \rightarrow \mu^+\mu^-) = (5.88 \pm 0.10)\%$.

X(3872) $\Gamma(i)\Gamma(\gamma\gamma)/\Gamma(\text{total})$

$\Gamma(\gamma\gamma) \times \Gamma(\pi^+\pi^- J/\psi(1S))/\Gamma_{\text{total}}$ $\Gamma_3\Gamma_2/\Gamma$

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

<12.9	90	⁶ DOBBS	05	CLE3 $e^+e^- \rightarrow \pi^+\pi^- J/\psi\gamma$
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⁶ Assuming X(3872) has positive C parity and spin 0.

X(3872) BRANCHING RATIOS

$\Gamma(\gamma\chi_{c1})/\Gamma(\pi^+\pi^- J/\psi(1S))$ Γ_7/Γ_2

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
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<0.89	90	CHOI	03	BELL $B \rightarrow K\pi^+\pi^- J/\psi$
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$\Gamma(\eta J/\psi)/\Gamma(\pi^+\pi^- J/\psi(1S))$ Γ_8/Γ_2

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

<0.6	90	AUBERT	04Y	BABR $B \rightarrow K\eta J/\psi$
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$\Gamma(D^0\bar{D}^0)/\Gamma(\pi^+\pi^- J/\psi(1S))$ Γ_4/Γ_2

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

not seen		CHISTOV	04	BELL $B \rightarrow KD^0\bar{D}^0$
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$\Gamma(D^+ D^-)/\Gamma(\pi^+ \pi^- J/\psi(1S))$ Γ_5/Γ_2

VALUE DOCUMENT ID TECN COMMENT

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

not seen CHISTOV 04 BELL $B \rightarrow K D^+ D^-$

$\Gamma(D^0 \bar{D}^0 \pi^0)/\Gamma(\pi^+ \pi^- J/\psi(1S))$ Γ_6/Γ_2

VALUE DOCUMENT ID TECN COMMENT

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

not seen CHISTOV 04 BELL $B \rightarrow K D^0 \bar{D}^0 \pi$

X(3872) REFERENCES

AUBERT	05B	PR D71 031501	B. Aubert <i>et al.</i>	(BABAR Collab.)
DOBBS	05	PRL 94 032004	S. Dobbs <i>et al.</i>	(CLEO Collab.)
ABAZOV	04F	PRL 93 162002	V.M. Abazov <i>et al.</i>	(D0 Collab.)
ACOSTA	04	PRL 93 072001	D. Acosta <i>et al.</i>	(CDF Collab.)
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CHOI	03	PRL 91 262001	S.-K. Choi <i>et al.</i>	(BELLE Collab.)
BAI	98E	PR D57 3854	J.Z. Bai <i>et al.</i>	(BES Collab.)

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