

X(3872)

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

First observed 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. Iovector hypothesis excluded by AUBERT 05B and CHOI 11.

AAIJ 13Q perform a full five-dimensional amplitude analysis of the angular correlations between the decay products in $B^+ \rightarrow X(3872) K^+$ decays, where $X(3872) \rightarrow J/\psi \pi^+ \pi^-$ and $J/\psi \rightarrow \mu^+ \mu^-$, which unambiguously gives the $J^{PC} = 1^{++}$ assignment.

See our note on “Developments in Heavy Quarkonium Spectroscopy”.

X(3872) MASS FROM $J/\psi X$ MODE

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
3871.69 ± 0.17 OUR AVERAGE				
3871.9 ± 0.7 ± 0.2	20 ± 5	ABLIKIM 14	BES3	$e^+ e^- \rightarrow J/\psi \pi^+ \pi^- \gamma$
3871.95 ± 0.48 ± 0.12	0.6k	AAIJ 12H	LHCB	$pp \rightarrow J/\psi \pi^+ \pi^- X$
3871.85 ± 0.27 ± 0.19	~ 170	¹ CHOI 11	BELL	$B \rightarrow K \pi^+ \pi^- J/\psi$
3873 + 1.8 ± 1.3 - 1.6	27 ± 8	² DEL-AMO-SA.10B	BABR	$B \rightarrow \omega J/\psi K$
3871.61 ± 0.16 ± 0.19	6k	^{2,3} AALTONEN 09AU	CDF2	$p\bar{p} \rightarrow J/\psi \pi^+ \pi^- X$
3871.4 ± 0.6 ± 0.1	93.4	AUBERT 08Y	BABR	$B^+ \rightarrow K^+ J/\psi \pi^+ \pi^-$
3868.7 ± 1.5 ± 0.4	9.4	AUBERT 08Y	BABR	$B^0 \rightarrow K_S^0 J/\psi \pi^+ \pi^-$
3871.8 ± 3.1 ± 3.0	522	^{2,4} ABAZOV 04F	D0	$p\bar{p} \rightarrow J/\psi \pi^+ \pi^- X$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
3868.6 ± 1.2 ± 0.2	8	⁵ AUBERT 06	BABR	$B^0 \rightarrow K_S^0 J/\psi \pi^+ \pi^-$
3871.3 ± 0.6 ± 0.1	61	⁵ AUBERT 06	BABR	$B^- \rightarrow K^- J/\psi \pi^+ \pi^-$
3873.4 ± 1.4	25	⁶ AUBERT 05R	BABR	$B^+ \rightarrow K^+ J/\psi \pi^+ \pi^-$
3871.3 ± 0.7 ± 0.4	730	^{2,7} ACOSTA 04	CDF2	$p\bar{p} \rightarrow J/\psi \pi^+ \pi^- X$
3872.0 ± 0.6 ± 0.5	36	⁸ CHOI 03	BELL	$B \rightarrow K \pi^+ \pi^- J/\psi$
3836 ± 13	58	^{2,9} ANTONIAZZI 94	E705	$300 \pi^\pm Li \rightarrow J/\psi \pi^+ \pi^- X$

¹ The mass difference for the X(3872) produced in B^+ and B^0 decays is $(-0.71 \pm 0.96 \pm 0.19)$ MeV.

² Width consistent with detector resolution.

³ A possible equal mixture of two states with a mass difference greater than 3.6 MeV/ c^2 is excluded at 95% CL.

⁴ Calculated from the corresponding $m_{X(3872)} - m_{J/\psi}$ using $m_{J/\psi} = 3096.916$ MeV.

⁵ Calculated from the corresponding $m_{X(3872)} - m_{\psi(2S)}$ using $m_{\psi(2S)} = 3686.093$ MeV. Superseded by AUBERT 08Y.

⁶ Calculated from the corresponding $m_{X(3872)} - m_{\psi(2S)}$ using $m_{\psi(2S)} = 3685.96$ MeV. Superseded by AUBERT 06.

⁷ Superseded by AALTONEN 09AU.

⁸ Superseded by CHOI 11.

⁹ A lower mass value can be due to an incorrect momentum scale for soft pions.

X(3872) MASS FROM $\bar{D}^{*0} D^0$ MODE

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$3872.9^{+0.6+0.4}_{-0.4-0.5}$	50	^{1,2} AUSHEV	10 BELL	$B \rightarrow \bar{D}^{*0} D^0 K$
$3875.1^{+0.7}_{-0.5} \pm 0.5$	33 ± 6	² AUBERT	08B BABR	$B \rightarrow \bar{D}^{*0} D^0 K$
$3875.2 \pm 0.7^{+0.9}_{-1.8}$	24 ± 6	^{2,3} GOKHROO	06 BELL	$B \rightarrow D^0 \bar{D}^0 \pi^0 K$

¹ Calculated from the measured $m_{X(3872)} - m_{D^{*0}} - m_{\bar{D}^0} = 1.1^{+0.6+0.1}_{-0.4-0.3}$ MeV.

² Experiments report $D^{*0} \bar{D}^0$ invariant mass above $D^{*0} \bar{D}^0$ threshold because D^{*0} decay products are kinematically constrained to the D^{*0} mass, even though the D^{*0} may decay off-shell.

³ Superseded by AUSHEV 10.

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

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

 $m_{X(3872)} - m_{\psi(2S)}$

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
187.4 ± 1.4	25	¹ AUBERT	05R BABR	$B^+ \rightarrow K^+ J/\psi \pi^+ \pi^-$

¹ Superseded by AUBERT 06.

X(3872) WIDTH

VALUE (MeV)	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
<1.2	90		CHOI	11 BELL	$B \rightarrow K \pi^+ \pi^- J/\psi$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<2.4	90		ABLIKIM	14 BES3	$e^+ e^- \rightarrow J/\psi \pi^+ \pi^- \gamma$
<3.3	90		AUBERT	08Y BABR	$B^+ \rightarrow K^+ J/\psi \pi^+ \pi^-$
<4.1	90	69	AUBERT	06 BABR	$B \rightarrow K \pi^+ \pi^- J/\psi$
<2.3	90	36	¹ CHOI	03 BELL	$B \rightarrow K \pi^+ \pi^- J/\psi$

¹ Superseded by CHOI 11.

X(3872) WIDTH FROM $\bar{D}^{*0} D^0$ MODE

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$3.9^{+2.8+0.2}_{-1.4-1.1}$	50	¹ AUSHEV	10 BELL	$B \rightarrow \bar{D}^{*0} D^0 K$
$3.0^{+1.9}_{-1.4} \pm 0.9$	33 ± 6	AUBERT	08B BABR	$B \rightarrow \bar{D}^{*0} D^0 K$

¹ With a measured value of $B(B \rightarrow X(3872) K) \times B(X(3872) \rightarrow D^{*0} \bar{D}^0) = (0.80 \pm 0.20 \pm 0.10) \times 10^{-4}$, assumed to be equal for both charged and neutral modes.

X(3872) DECAY MODES

Mode	Fraction (Γ_i/Γ)
Γ_1 $e^+ e^-$	
Γ_2 $\pi^+ \pi^- J/\psi(1S)$	> 2.6 %
Γ_3 $\rho^0 J/\psi(1S)$	
Γ_4 $\omega J/\psi(1S)$	> 1.9 %
Γ_5 $D^0 \bar{D}^0 \pi^0$	>32 %
Γ_6 $\bar{D}^{*0} D^0$	>24 %
Γ_7 $\gamma\gamma$	
Γ_8 $D^0 \bar{D}^0$	
Γ_9 $D^+ D^-$	
Γ_{10} $\gamma\chi_{c1}$	
Γ_{11} $\gamma\chi_{c2}$	
Γ_{12} $\gamma J/\psi$	> 6×10^{-3}
Γ_{13} $\gamma\psi(2S)$	> 3.0 %
Γ_{14} $\pi^+ \pi^- \eta_c(1S)$	not seen
Γ_{15} $\rho\bar{\rho}$	not seen

C-violating decays

Γ_{16} $\eta J/\psi$	
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X(3872) PARTIAL WIDTHS

$\Gamma(e^+ e^-)$					Γ_1
VALUE (keV)	CL%	DOCUMENT ID	TECN	COMMENT	
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.28	90	¹ YUAN	04	RVUE $e^+ e^- \rightarrow \pi^+ \pi^- J/\psi$	
¹ 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) $\Gamma(i)\Gamma(e^+ e^-)/\Gamma(\text{total})$

$\Gamma(\pi^+ \pi^- J/\psi(1S)) \times \Gamma(e^+ e^-)/\Gamma_{\text{total}}$					$\Gamma_2 \Gamma_1/\Gamma$
VALUE (eV)	CL%	DOCUMENT ID	TECN	COMMENT	
< 6.2	90	^{1,2} AUBERT	05D	BABR $10.6 e^+ e^- \rightarrow K^+ K^- \pi^+ \pi^- \gamma$	
• • • We do not use the following data for averages, fits, limits, etc. • • •					
< 8.3	90	² DOBBS	05	CLE3 $e^+ e^- \rightarrow \pi^+ \pi^- J/\psi$	
<10	90	³ YUAN	04	RVUE $e^+ e^- \rightarrow \pi^+ \pi^- J/\psi$	
¹ Using $B(X(3872) \rightarrow J/\psi \pi^+ \pi^-) \cdot B(J/\psi \rightarrow \mu^+ \mu^-) \cdot \Gamma(X(3872) \rightarrow e^+ e^-) < 0.37$ eV from AUBERT 05D and $B(J/\psi \rightarrow \mu^+ \mu^-) = 0.0588 \pm 0.0010$ from the PDG 04.					
² Assuming X(3872) has $J^{PC} = 1^{--}$.					
³ Using BAI 98E data on $e^+ e^- \rightarrow \pi^+ \pi^- \ell^+ \ell^-$. From theoretical calculation of the production cross section and using $B(J/\psi \rightarrow \mu^+ \mu^-) = (5.88 \pm 0.10)\%$.					

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

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

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	¹ DOBBS	05	CLE3 $e^+e^- \rightarrow \pi^+\pi^- J/\psi\gamma$
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¹ Assuming $X(3872)$ has positive C parity and spin 0.

$\Gamma(\omega J/\psi(1S)) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}} \quad \Gamma_4\Gamma/\Gamma$

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

<1.7	90	¹ LEES	12AD	BABR $e^+e^- \rightarrow e^+e^-\omega J/\psi$
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¹ Assuming $X(3872)$ has spin 2.

$\Gamma(\pi^+\pi^-\eta_c(1S)) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}} \quad \Gamma_{14}\Gamma/\Gamma$

VALUE (eV)	CL%	DOCUMENT ID	TECN	COMMENT
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<11.1	90	LEES	12AE	BABR $e^+e^- \rightarrow e^+e^-\pi^+\pi^-\eta_c$
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$X(3872)$ BRANCHING RATIOS

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

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
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>0.026	93 ± 17	¹ AUBERT	08Y	BABR $B \rightarrow X(3872)K$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

>0.04	30	² AUBERT	05R	BABR $B^+ \rightarrow K^+ J/\psi\pi^+\pi^-$
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>0.04	36 ± 7	³ CHOI	03	BABR $B^+ \rightarrow K^+ J/\psi\pi^+\pi^-$
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¹ AUBERT 08Y reports $[\Gamma(X(3872) \rightarrow \pi^+\pi^- J/\psi(1S))/\Gamma_{\text{total}}] \times [B(B^+ \rightarrow X(3872)K^+)] = (8.4 \pm 1.5 \pm 0.7) \times 10^{-6}$ which we divide by our best value $B(B^+ \rightarrow X(3872)K^+) < 3.2 \times 10^{-4}$.

² Superseded by AUBERT 08Y. AUBERT 05R reports $[\Gamma(X(3872) \rightarrow \pi^+\pi^- J/\psi(1S))/\Gamma_{\text{total}}] \times [B(B^+ \rightarrow X(3872)K^+)] = (1.28 \pm 0.41) \times 10^{-5}$ which we divide by our best value $B(B^+ \rightarrow X(3872)K^+) < 3.2 \times 10^{-4}$.

³ CHOI 03 reports $[\Gamma(X(3872) \rightarrow \pi^+\pi^- J/\psi(1S))/\Gamma_{\text{total}}] \times [B(B^+ \rightarrow X(3872)K^+)] / [B(B^+ \rightarrow \psi(2S)K^+)] / [B(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-)] = 0.063 \pm 0.012 \pm 0.007$ which we multiply or divide by our best values $B(B^+ \rightarrow X(3872)K^+) < 3.2 \times 10^{-4}$, $B(B^+ \rightarrow \psi(2S)K^+) = (6.26 \pm 0.24) \times 10^{-4}$, $B(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-) = (34.46 \pm 0.30) \times 10^{-2}$.

$\Gamma(\omega J/\psi(1S))/\Gamma_{\text{total}} \quad \Gamma_4/\Gamma$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
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>0.019	21 ± 7	¹ DEL-AMO-SA..10B	BABR	$B^+ \rightarrow \omega J/\psi K^+$
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¹ DEL-AMO-SANCHEZ 10B reports $[\Gamma(X(3872) \rightarrow \omega J/\psi(1S))/\Gamma_{\text{total}}] \times [B(B^+ \rightarrow X(3872)K^+)] = (6 \pm 2 \pm 1) \times 10^{-6}$ which we divide by our best value $B(B^+ \rightarrow X(3872)K^+) < 3.2 \times 10^{-4}$. DEL-AMO-SANCHEZ 10B also reports $B(B^0 \rightarrow X(3872)K^0) \times B(X(3872) \rightarrow J/\psi\omega) = (6 \pm 3 \pm 1) \times 10^{-6}$.

$\Gamma(\omega J/\psi(1S))/\Gamma(\pi^+\pi^- J/\psi(1S))$ Γ_4/Γ_2

VALUE	DOCUMENT ID	TECN	COMMENT
0.8±0.3	¹ DEL-AMO-SA..10B	BABR	$B \rightarrow \omega J/\psi K$

¹ Statistical and systematic errors added in quadrature. Uses the values of $B(B \rightarrow X(3872)K) \times B(X(3872) \rightarrow J/\psi \pi^+ \pi^-)$ reported in AUBERT 08Y, taking into account the common systematics.

$\Gamma(D^0 \bar{D}^0 \pi^0)/\Gamma_{\text{total}}$ Γ_5/Γ

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
>0.32	17 ± 5	¹ GOKHROO 06	BELL	$B^+ \rightarrow D^0 \bar{D}^0 \pi^0 K^+$

¹ GOKHROO 06 reports $[\Gamma(X(3872) \rightarrow D^0 \bar{D}^0 \pi^0)/\Gamma_{\text{total}}] \times [B(B^+ \rightarrow X(3872)K^+)] = (1.02 \pm 0.31^{+0.21}_{-0.29}) \times 10^{-4}$ which we divide by our best value $B(B^+ \rightarrow X(3872)K^+) < 3.2 \times 10^{-4}$.

$\Gamma(\bar{D}^{*0} D^0)/\Gamma_{\text{total}}$ Γ_6/Γ

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
>0.24	41^{+9}_{-8}	¹ AUSHEV 10	BELL	$B^+ \rightarrow \bar{D}^{*0} D^0 K^+$

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

>0.5	27 ± 6	² AUBERT 08B	BABR	$B^+ \rightarrow \bar{D}^{*0} D^0 K^+$
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¹ AUSHEV 10 reports $[\Gamma(X(3872) \rightarrow \bar{D}^{*0} D^0)/\Gamma_{\text{total}}] \times [B(B^+ \rightarrow X(3872)K^+)] = (0.77 \pm 0.16 \pm 0.10) \times 10^{-4}$ which we divide by our best value $B(B^+ \rightarrow X(3872)K^+) < 3.2 \times 10^{-4}$.

² AUBERT 08B reports $[\Gamma(X(3872) \rightarrow \bar{D}^{*0} D^0)/\Gamma_{\text{total}}] \times [B(B^+ \rightarrow X(3872)K^+)] = (1.67 \pm 0.36 \pm 0.47) \times 10^{-4}$ which we divide by our best value $B(B^+ \rightarrow X(3872)K^+) < 3.2 \times 10^{-4}$.

$\Gamma(D^0 \bar{D}^0 \pi^0)/\Gamma(\pi^+\pi^- J/\psi(1S))$ Γ_5/Γ_2

VALUE	DOCUMENT ID	TECN	COMMENT
seen	¹ GOKHROO 06	BELL	$B \rightarrow D^0 \bar{D}^0 \pi^0 K$

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

seen	AUSHEV 10	BELL	$B \rightarrow D^0 \bar{D}^0 \pi^0 K$
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¹ May not necessarily be the same state as that observed in the $J/\psi \pi^+ \pi^-$ mode. Supersedes CHISTOV 04.

$\Gamma(D^0 \bar{D}^0)/\Gamma(\pi^+\pi^- J/\psi(1S))$ Γ_8/Γ_2

VALUE	DOCUMENT ID	TECN	COMMENT
not seen	CHISTOV 04	BELL	$B \rightarrow K D^0 \bar{D}^0$

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

$\Gamma(D^+ D^-)/\Gamma(\pi^+\pi^- J/\psi(1S))$ Γ_9/Γ_2

VALUE	DOCUMENT ID	TECN	COMMENT
not seen	CHISTOV 04	BELL	$B \rightarrow K D^+ D^-$

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

not seen

$\Gamma(\gamma\chi_{c1})/\Gamma(\pi^+\pi^-J/\psi(1S))$ Γ_{10}/Γ_2

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
not seen		¹ BHARDWAJ 13	BELL	$B^+ \rightarrow \chi_{c1}\gamma K^+$
<0.89	90	CHOI 03	BELL	$B \rightarrow K\pi^+\pi^-J/\psi$

¹ Reported $B(B^\pm \rightarrow X(3872)K^\pm) \times B(X(3872) \rightarrow \gamma\chi_{c1}) < 1.9 \times 10^{-6}$ at 90% CL.

$\Gamma(\gamma\chi_{c2})/\Gamma(\pi^+\pi^-J/\psi(1S))$ Γ_{11}/Γ_2

VALUE	DOCUMENT ID	TECN	COMMENT
not seen	¹ BHARDWAJ 13	BELL	$B^\pm \rightarrow \chi_{c2}\gamma K^+$

¹ Reported $B(B^\pm \rightarrow X(3872)K^\pm) \times B(X(3872) \rightarrow \gamma\chi_{c2}) < 6.7 \times 10^{-6}$ at 90% CL.

$\Gamma(\gamma J/\psi)/\Gamma_{total}$ Γ_{12}/Γ

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
>6 $\times 10^{-3}$		¹ BHARDWAJ 11	BELL	$B^\pm \rightarrow \gamma J/\psi K^\pm$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
>9 $\times 10^{-3}$	20	² AUBERT 09B	BABR	$B^+ \rightarrow \gamma J/\psi K^+$
>0.010	19	³ AUBERT, BE 06M	BABR	$B^+ \rightarrow \gamma J/\psi K^+$

¹ BHARDWAJ 11 reports $[\Gamma(X(3872) \rightarrow \gamma J/\psi)/\Gamma_{total}] \times [B(B^+ \rightarrow X(3872)K^+)] = (1.78^{+0.48}_{-0.44} \pm 0.12) \times 10^{-6}$ which we divide by our best value $B(B^+ \rightarrow X(3872)K^+) < 3.2 \times 10^{-4}$.

² AUBERT 09B reports $[\Gamma(X(3872) \rightarrow \gamma J/\psi)/\Gamma_{total}] \times [B(B^+ \rightarrow X(3872)K^+)] = (2.8 \pm 0.8 \pm 0.1) \times 10^{-6}$ which we divide by our best value $B(B^+ \rightarrow X(3872)K^+) < 3.2 \times 10^{-4}$.

³ Superseded by AUBERT 09B. AUBERT, BE 06M reports $[\Gamma(X(3872) \rightarrow \gamma J/\psi)/\Gamma_{total}] \times [B(B^+ \rightarrow X(3872)K^+)] = (3.3 \pm 1.0 \pm 0.3) \times 10^{-6}$ which we divide by our best value $B(B^+ \rightarrow X(3872)K^+) < 3.2 \times 10^{-4}$.

$\Gamma(\gamma\psi(2S))/\Gamma_{total}$ Γ_{13}/Γ

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
seen	36 ± 9	¹ AAIJ 14AH	LHCB	$B^+ \rightarrow \gamma\psi(2S)K^+$
>0.030	25 ± 7	² AUBERT 09B	BABR	$B^+ \rightarrow \gamma\psi(2S)K^+$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
not seen		³ BHARDWAJ 11	BELL	$B^+ \rightarrow \gamma\psi(2S)K^+$

¹ From 36.4 ± 9 events of $X(3872) \rightarrow J/\psi\gamma$ decays with a statistical significance of 4.4σ.

² AUBERT 09B reports $[\Gamma(X(3872) \rightarrow \gamma\psi(2S))/\Gamma_{total}] \times [B(B^+ \rightarrow X(3872)K^+)] = (9.5 \pm 2.7 \pm 0.6) \times 10^{-6}$ which we divide by our best value $B(B^+ \rightarrow X(3872)K^+) < 3.2 \times 10^{-4}$.

³ BHARDWAJ 11 reports $B(B^+ \rightarrow K^+X(3872)) \times B(X \rightarrow \gamma\psi(2S)) < 3.45 \times 10^{-6}$ at 90% CL.

$\Gamma(\gamma\psi(2S))/\Gamma(\gamma J/\psi)$ Γ_{13}/Γ_{12}

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
2.6 ± 0.6 OUR AVERAGE					
2.46 ± 0.64 ± 0.29		36 ± 9	¹ AAIJ 14AH	LHCB	$B^+ \rightarrow \gamma\psi(2S)K^+$
3.4 ± 1.4			AUBERT 09B	BABR	$B^+ \rightarrow \gamma c\bar{c}K^+$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●					
<2.1	90		BHARDWAJ 11	BELL	$B^+ \rightarrow \gamma\psi(2S)K^+$

¹ From 36.4 ± 9 events of $X(3872) \rightarrow J/\psi\gamma$ decays with a statistical significance of 4.4σ.

$\Gamma(\rho\bar{\rho})/\Gamma(\pi^+\pi^- J/\psi(1S))$					Γ_{15}/Γ_2
VALUE	CL%	DOCUMENT ID	TECN	COMMENT	
$<2.0 \times 10^{-3}$	95	¹ AAIJ	13S LHCb	$B^+ \rightarrow \rho\bar{\rho}K^+$	

¹ AAIJ 13S reports $[\Gamma(X(3872) \rightarrow \rho\bar{\rho})/\Gamma(X(3872) \rightarrow \pi^+\pi^- J/\psi(1S))] \times [B(B^+ \rightarrow X(3872)K^+, X \rightarrow J/\psi\pi^+\pi^-)] < 1.7 \times 10^{-8}$ which we divide by our best value $B(B^+ \rightarrow X(3872)K^+, X \rightarrow J/\psi\pi^+\pi^-) = 8.6 \times 10^{-6}$.

————— C-violating decays —————

$\Gamma(\eta J/\psi)/\Gamma(\pi^+\pi^- J/\psi(1S))$					Γ_{16}/Γ_2
VALUE	CL%	DOCUMENT ID	TECN	COMMENT	
<0.6	90	AUBERT	04Y BABR	$B \rightarrow K\eta J/\psi$	

X(3872) REFERENCES

AAIJ	14AH	NP B886 665	R. Aaij <i>et al.</i>	(LHCb Collab.)
ABLIKIM	14	PRL 112 092001	M. Ablikim <i>et al.</i>	(BES III Collab.)
AAIJ	13Q	PRL 110 222001	R. Aaij <i>et al.</i>	(LHCb Collab.) JP
AAIJ	13S	EPJ C73 2462	R. Aaij <i>et al.</i>	(LHCb Collab.)
BHARDWAJ	13	PRL 111 032001	V. Bhardwaj <i>et al.</i>	(BELLE Collab.)
AAIJ	12H	EPJ C72 1972	R. Aaij <i>et al.</i>	(LHCb Collab.)
LEES	12AD	PR D86 072002	J.P. Lees <i>et al.</i>	(BABAR Collab.)
LEES	12AE	PR D86 092005	J.P. Lees <i>et al.</i>	(BABAR Collab.)
BHARDWAJ	11	PRL 107 091803	V. Bhardwaj <i>et al.</i>	(BELLE Collab.)
CHOI	11	PR D84 052004	S.-K. Choi <i>et al.</i>	(BELLE Collab.)
AUSHEV	10	PR D81 031103	T. Aushev <i>et al.</i>	(BELLE Collab.)
DEL-AMO-SA...	10B	PR D82 011101	P. del Amo Sanchez <i>et al.</i>	(BABAR Collab.)
AALTONEN	09AU	PRL 103 152001	T. Aaltonen <i>et al.</i>	(CDF Collab.)
AUBERT	09B	PRL 102 132001	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	08B	PR D77 011102	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	08Y	PR D77 111101	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	06	PR D73 011101	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,BE	06M	PR D74 071101	B. Aubert <i>et al.</i>	(BABAR Collab.)
GOKHROO	06	PRL 97 162002	G. Gokhroo <i>et al.</i>	(BELLE Collab.)
AUBERT	05B	PR D71 031501	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	05D	PR D71 052001	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	05R	PR D71 071103	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.)
AUBERT	04Y	PRL 93 041801	B. Aubert <i>et al.</i>	(BABAR Collab.)
CHISTOV	04	PRL 93 051803	R. Chistov <i>et al.</i>	(BELLE Collab.)
PDG	04	PL B592 1	S. Eidelman <i>et al.</i>	(PDG Collab.)
YUAN	04	PL B579 74	C.Z. Yuan <i>et al.</i>	
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.)
ANTONIAZZI	94	PR D50 4258	L. Antoniazzi <i>et al.</i>	(E705 Collab.)