

$X(10610)^\pm$

$$I^G(J^P) = 1^+(1^+)$$

OMITTED FROM SUMMARY TABLE

Observed by BONDAR 12 in $\Upsilon(5S)$ decays to $\Upsilon(nS)\pi^+\pi^-$ ($n = 1, 2, 3$) and $h_b(mP)\pi^+\pi^-$ ($m = 1, 2$). $J^P = 1^+$ is favored from angular analyses. Isospin = 1 is favored due to observation by KROKOVNY 13 of a corresponding neutral state produced in $\Upsilon(10860) \rightarrow \Upsilon(2S)/\Upsilon(3S)\pi^0\pi^0$ decays at a consistent mass.

 $X(10610)^\pm$ MASS

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
10607.2 ± 2.0	¹ BONDAR	12	BELL $e^+e^- \rightarrow$ hadrons
• • • We do not use the following data for averages, fits, limits, etc. • • •			
10611 $\pm 4 \pm 3$	² BONDAR	12	BELL $e^+e^- \rightarrow \Upsilon(1S)\pi^+\pi^-$
10609 $\pm 2 \pm 3$	² BONDAR	12	BELL $e^+e^- \rightarrow \Upsilon(2S)\pi^+\pi^-$
10608 $\pm 2 \pm 3$	² BONDAR	12	BELL $e^+e^- \rightarrow \Upsilon(3S)\pi^+\pi^-$
10605 $\pm 2 \begin{smallmatrix} +3 \\ -1 \end{smallmatrix}$	² BONDAR	12	BELL $e^+e^- \rightarrow h_b(1P)\pi^+\pi^-$
10599 $\begin{smallmatrix} +6 \\ -3 \end{smallmatrix} \begin{smallmatrix} +5 \\ -4 \end{smallmatrix}$	² BONDAR	12	BELL $e^+e^- \rightarrow h_b(2P)\pi^+\pi^-$

¹ Average of the BONDAR 12 measurements in separate channels.² Superseded by the average measurement of BONDAR 12. **$X(10610)^\pm$ WIDTH**

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
18.4 ± 2.4	³ BONDAR	12	BELL $e^+e^- \rightarrow$ hadrons
• • • We do not use the following data for averages, fits, limits, etc. • • •			
22.3 $\pm 7.7 \begin{smallmatrix} +3.0 \\ -4.0 \end{smallmatrix}$	⁴ BONDAR	12	BELL $e^+e^- \rightarrow \Upsilon(1S)\pi^+\pi^-$
24.2 $\pm 3.1 \begin{smallmatrix} +2.0 \\ -3.0 \end{smallmatrix}$	⁴ BONDAR	12	BELL $e^+e^- \rightarrow \Upsilon(2S)\pi^+\pi^-$
17.6 $\pm 3.0 \pm 3.0$	⁴ BONDAR	12	BELL $e^+e^- \rightarrow \Upsilon(3S)\pi^+\pi^-$
11.4 $\begin{smallmatrix} +4.5+2.1 \\ -3.9-1.2 \end{smallmatrix}$	⁴ BONDAR	12	BELL $e^+e^- \rightarrow h_b(1P)\pi^+\pi^-$
13 $\begin{smallmatrix} +10 \\ -8 \end{smallmatrix} \begin{smallmatrix} +9 \\ -7 \end{smallmatrix}$	⁴ BONDAR	12	BELL $e^+e^- \rightarrow h_b(2P)\pi^+\pi^-$

³ Average of the BONDAR 12 measurements in separate channels.⁴ Superseded by the average measurement of BONDAR 12.

$X(10610)^+$ DECAY MODES $X(10610)^-$ decay modes are charge conjugates of the modes below.

Mode	Fraction (Γ_i/Γ)
$\Gamma_1 \quad \gamma(1S)\pi^+$	seen
$\Gamma_2 \quad \gamma(2S)\pi^+$	seen
$\Gamma_3 \quad \gamma(3S)\pi^+$	seen
$\Gamma_4 \quad h_b(1P)\pi^+$	seen
$\Gamma_5 \quad h_b(2P)\pi^+$	seen

 $X(10610)^\pm$ BRANCHING RATIOS

$\Gamma(\gamma(1S)\pi^+)/\Gamma_{\text{total}}$	Γ_1/Γ
<u>VALUE</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>
seen	BONDAR 12 BELL $e^+e^- \rightarrow \gamma(1S)\pi^+\pi^-$
$\Gamma(\gamma(2S)\pi^+)/\Gamma_{\text{total}}$	Γ_2/Γ
<u>VALUE</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>
seen	BONDAR 12 BELL $e^+e^- \rightarrow \gamma(2S)\pi^+\pi^-$
$\Gamma(\gamma(3S)\pi^+)/\Gamma_{\text{total}}$	Γ_3/Γ
<u>VALUE</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>
seen	BONDAR 12 BELL $e^+e^- \rightarrow \gamma(3S)\pi^+\pi^-$
$\Gamma(h_b(1P)\pi^+)/\Gamma_{\text{total}}$	Γ_4/Γ
<u>VALUE</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>
seen	BONDAR 12 BELL $e^+e^- \rightarrow h_b(1P)\pi^+\pi^-$
$\Gamma(h_b(2P)\pi^+)/\Gamma_{\text{total}}$	Γ_5/Γ
<u>VALUE</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>
seen	BONDAR 12 BELL $e^+e^- \rightarrow h_b(2P)\pi^+\pi^-$

 $X(10610)^\pm$ REFERENCES

KROKOVNY 13	PR D88 052016	P. Krokovny <i>et al.</i>	(BELLE Collab.)
BONDAR 12	PRL 108 122001	A. Bondar <i>et al.</i>	(BELLE Collab.)