

X(4140)

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

OMITTED FROM SUMMARY TABLE

Needs confirmation.

Seen by AALTONEN 09AH and ABAZOV 14A in the $B^+ \rightarrow X K^+$,
 $X \rightarrow J/\psi \phi$. Not seen by SHEN 10 in $\gamma\gamma \rightarrow J/\psi \phi$ or AAIJ 12AA
in $B^+ \rightarrow J/\psi \phi K^+$.

X(4140) MASS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
$4159.0 \pm 4.3 \pm 6.6$	52 ± 19	¹ ABAZOV	14A D0	$B^+ \rightarrow J/\psi \phi K^+$
$4143.0 \pm 2.9 \pm 1.2$	14 ± 5	² AALTONEN	09AH CDF	$B^+ \rightarrow J/\psi \phi K^+$
¹ Statistical significance of 3.1 σ .				
² Statistical significance of 3.8 σ .				

X(4140) WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
$20 \pm 13 \pm \frac{+3}{-8}$	52 ± 19	³ ABAZOV	14A D0	$B^+ \rightarrow J/\psi \phi K^+$
$11.7 \pm \frac{8.3}{-5.0} \pm 3.7$	14 ± 5	⁴ AALTONEN	09AH CDF	$B^+ \rightarrow J/\psi \phi K^+$
³ Statistical significance of 3.1 σ .				
⁴ Statistical significance of 3.8 σ .				

X(4140) DECAY MODES

Mode	Fraction (Γ_i/Γ)
$\Gamma_1 \quad J/\psi \phi$	not seen
$\Gamma_2 \quad \gamma\gamma$	not seen

X(4140) $\Gamma(i)\Gamma(\gamma\gamma)/\Gamma(\text{total})$

$\Gamma(\gamma\gamma) \times \Gamma(J/\psi \phi)/\Gamma_{\text{total}}$					$\Gamma_2 \Gamma_1/\Gamma$
VALUE (eV)	CL%	DOCUMENT ID	TECN	COMMENT	
<41	90	⁵ SHEN	10 BELL	$10.6 e^+ e^- \rightarrow e^+ e^- J/\psi \phi$	
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●					
< 6	90	⁶ SHEN	10 BELL	$10.6 e^+ e^- \rightarrow e^+ e^- J/\psi \phi$	
⁵ For $J^P = 0^+$.					
⁶ For $J^P = 2^+$.					

X(4140) BRANCHING RATIOS

$\Gamma(J/\psi\phi)/\Gamma_{\text{total}}$				Γ_1/Γ
<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
not seen		⁷ AAIJ	12AA LHCb	$pp \rightarrow B^+ X$ at 7 TeV
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
seen	52 ± 19	⁸ ABAZOV	14A D0	$B^+ \rightarrow J/\psi\phi K^+$
seen	14 ± 5	⁹ AALTONEN	09AH CDF	$B^+ \rightarrow J/\psi\phi K^+$

⁷ Reported $B(B^+ \rightarrow X(4140)K^+) \cdot B(X(4140) \rightarrow J/\psi\phi)/B(B^+ \rightarrow J/\psi\phi K^+) < 0.07$ at 90% CL.

⁸ ABAZOV 14A reports $B(B^+ \rightarrow X(4140)K^+ \rightarrow J/\psi\phi K^+)/B(B^+ \rightarrow J/\psi\phi K^+) = (19 \pm 7 \pm 4)\%$ with 3.1σ significance.

⁹ Statistical significance of 3.8σ .

$\Gamma(\gamma\gamma)/\Gamma_{\text{total}}$				Γ_2/Γ
<u>VALUE</u>		<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
not seen		SHEN	10 BELL	$10.6 e^+e^- \rightarrow e^+e^- J/\psi\phi$

X(4140) REFERENCES

ABAZOV	14A	PR D89 012004	V.M. Abazov <i>et al.</i>	(D0 Collab.)
AAIJ	12AA	PR D85 091103	R. Aaij <i>et al.</i>	(LHCb Collab.)
SHEN	10	PRL 104 112004	C.P. Shen <i>et al.</i>	(BELLE Collab.)
AALTONEN	09AH	PRL 102 242002	T. Aaltonen <i>et al.</i>	(CDF Collab.)