

**$B_2^*(5747)$**

$$I(J^P) = \frac{1}{2}(2^+)$$

$I, J, P$  need confirmation.

Quantum numbers shown are quark-model predictions.

### $B_2^*(5747)$ MASS

#### $B_2^*(5747)^+$ mass

OUR FIT uses  $m_{B^0}$  and  $m_{B_2^{*+}} - m_{B^0}$  to determine  $m_{B_2^*(5747)^+}$ .

VALUE (MeV)	DOCUMENT ID
<b>5737.3 ± 0.7 OUR FIT</b>	

#### $m_{B_2^{*+}} - m_{B^0}$

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>457.5 ± 0.7 OUR FIT</b>				
<b>457.5 ± 0.7 OUR AVERAGE</b>				
457.62 ± 0.72 ± 0.40	4k	<sup>1</sup> AAIJ	15AB	LHCB $p\bar{p}$ at 7, 8 TeV
457.3 ± 1.3 $\begin{smallmatrix} +0.3 \\ -0.9 \end{smallmatrix}$		<sup>2</sup> AALTONEN	14I	CDF $p\bar{p}$ at 1.96 TeV

<sup>1</sup> AAIJ 15AB reports  $[m_{B_2^{*+}} - m_{B^0}] - m_{\pi^+} = 318.1 \pm 0.7 \pm 0.4$  MeV which we adjust by the  $\pi^+$  mass. The masses inside the square brackets were measured for each candidate event.

<sup>2</sup> AALTONEN 14I reports  $m_{B_2^*(5747)^+} - m_{B^0} - m_{\pi^+} = 317.7 \pm 1.2 \begin{smallmatrix} +0.3 \\ -0.9 \end{smallmatrix}$  MeV which we adjusted by the  $\pi^+$  mass.

#### $B_2^*(5747)^0$ mass

OUR FIT uses  $m_{B^+}$ ,  $m_{B_1^0} - m_{B^+}$ , and mass differences below to determine  $m_{B_2^*(5747)^0}$ . The  $-0.659$  correlation between statistical uncertainties of  $m_{B_1^0} - m_{B^+}$  and  $m_{B_2^{*0}} - m_{B_1^0}$  measurements reported by ABAZOV 07T is taken into account.

VALUE (MeV)	DOCUMENT ID
<b>5739.6 ± 0.7 OUR FIT</b>	Error includes scale factor of 1.4.

#### $m_{B_2^{*0}} - m_{B_1^0}$

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
<b>13.5 ± 1.4 OUR FIT</b>	Error includes scale factor of 1.3.		
<b>26.2 ± 3.1 ± 0.9</b>	<sup>1</sup> ABAZOV	07T	D0 $p\bar{p}$ at 1.96 TeV

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

14.9 $\begin{smallmatrix} +2.2 +1.2 \\ -2.5 -1.4 \end{smallmatrix}$	<sup>1</sup> AALTONEN	09D	CDF	Repl. by AALTONEN 14I
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<sup>1</sup> Observed in  $B_2^{*0} \rightarrow B^{*+} \pi^-$  and  $B_2^{*0} \rightarrow B^+ \pi^-$ .

### $m_{B_2^{*0}} - m_{B^+}$

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>460.2 ± 0.6 OUR FIT</b>				Error includes scale factor of 1.4.
<b>459.9 ± 0.8 OUR AVERAGE</b>				Error includes scale factor of 1.8.
460.18 ± 0.37 ± 0.33	17k	<sup>1</sup> AAIJ	15AB LHCB	$p\bar{p}$ at 7, 8 TeV
457.5 ± 1.2 $\begin{smallmatrix} +0.8 \\ -0.9 \end{smallmatrix}$		<sup>2</sup> AALTONEN	14I CDF	$p\bar{p}$ at 1.96 TeV

<sup>1</sup> AAIJ 15AB reports  $[m_{B_2^{*0}} - m_{B^+}] - m_{\pi^-} = 320.6 \pm 0.4 \pm 0.3$  MeV which we adjust by the  $\pi^-$  mass. The masses inside the square brackets were measured for each candidate event.

<sup>2</sup> AALTONEN 14I reports  $m_{B_2^*(5747)^0} - m_{B^+} - m_{\pi^-} = 317.9 \pm 1.2 \begin{smallmatrix} +0.8 \\ -0.9 \end{smallmatrix}$  MeV which we adjusted by the  $\pi^-$  mass.

### $B_2^*(5747)$ WIDTH

#### $B_2^*(5747)^+$ width

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>20 ± 5 OUR AVERAGE</b>				Error includes scale factor of 2.2.
23.6 ± 2.0 ± 2.1	4k	AAIJ	15AB LHCB	$p\bar{p}$ at 7, 8 TeV
11 $\begin{smallmatrix} +4 & +3 \\ -3 & -4 \end{smallmatrix}$		AALTONEN	14I CDF	$p\bar{p}$ at 1.96 TeV

#### $B_2^*(5747)^0$ width

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>24.2 ± 1.7 OUR AVERAGE</b>				
24.5 ± 1.0 ± 1.5	17k	AAIJ	15AB LHCB	$p\bar{p}$ at 7, 8 TeV
22 $\begin{smallmatrix} +3 & +4 \\ -2 & -5 \end{smallmatrix}$		AALTONEN	14I CDF	$p\bar{p}$ at 1.96 TeV

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

22.7 $\begin{smallmatrix} +3.8 & +3.2 \\ -3.2 & -10.2 \end{smallmatrix}$		AALTONEN	09D CDF	Repl. by AALTONEN 14I
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### $B_2^*(5747)$ DECAY MODES

Mode	Fraction ( $\Gamma_i/\Gamma$ )
$\Gamma_1$ $B\pi$	seen
$\Gamma_2$ $B^*\pi$	seen

### $\Gamma(B\pi)/\Gamma_{\text{total}}$

VALUE	EVTS	DOCUMENT ID	TECN	CHG	COMMENT	$\Gamma_1/\Gamma$
seen	4k, 17k	AAIJ	15AB LHCB	±0	$p\bar{p}$ at 7, 8 TeV	
<b>seen</b>		AALTONEN	14I CDF	±	$p\bar{p}$ at 1.96 TeV	
seen		AALTONEN	09D CDF	0	$p\bar{p}$ at 1.96 TeV	
<b>seen</b>		ABAZOV	07T D0	0	$p\bar{p}$ at 1.96 TeV	

$\Gamma(B^* \pi) / \Gamma_{\text{total}}$						$\Gamma_2 / \Gamma$
<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>	
seen	4k,17k	AAIJ	15AB LHCB	$\pm 0$	$p p$ at 7, 8 TeV	
seen		AALTONEN	09D CDF	0	$p \bar{p}$ at 1.96 TeV	
<b>seen</b>		ABAZOV	07T D0	0	$p \bar{p}$ at 1.96 TeV	

$\Gamma(B^* \pi) / \Gamma(B \pi)$						$\Gamma_2 / \Gamma_1$
<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>	
<b>0.84 ± 0.27 OUR AVERAGE</b>						
0.71 ± 0.14 ± 0.30	17k	AAIJ	15AB LHCB	0	$p p$ at 7, 8 TeV	
1.0 ± 0.5 ± 0.8	4k	AAIJ	15AB LHCB	$\pm$	$p p$ at 7, 8 TeV	
1.10 ± 0.42 ± 0.31		<sup>1</sup> ABAZOV	07T D0	0	$p \bar{p}$ at 1.96 TeV	

<sup>1</sup> Converted from measured ratio of  $R = B(B_2^{*0} \rightarrow B^{*+} \pi^-) / B(B_2^{*0} \rightarrow B^{(*)+} \pi^-) = 0.475 \pm 0.095 \pm 0.069$ .

### $B_2^*(5747)$ REFERENCES

AAIJ	15AB	JHEP 1504 024	R. Aaij <i>et al.</i>	(LHCb Collab.)
AALTONEN	14I	PR D90 012013	T. Aaltonen <i>et al.</i>	(CDF Collab.)
AALTONEN	09D	PRL 102 102003	T. Aaltonen <i>et al.</i>	(CDF Collab.)
ABAZOV	07T	PRL 99 172001	V.M. Abazov <i>et al.</i>	(D0 Collab.)