

**$B_1(5721)$** 

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

$I, J, P$  need confirmation.

Quantum numbers shown are quark-model predictions.

 **$B_1(5721)$  MASS** **$B_1(5721)^+$  mass**OUR FIT uses  $m_{B^{*0}}$  and  $m_{B_1^+} - m_{B^{*0}}$  to determine  $m_{B_1(5721)^+}$ .

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>
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 **$5725.9^{+2.5}_{-2.7}$  OUR FIT** **$m_{B_1^+} - m_{B^{*0}}$** 

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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 **$401.2^{+2.4}_{-2.7}$  OUR FIT** **$401.2^{+2.4}_{-2.7}$  OUR AVERAGE**

$400.5 \pm 1.8 \pm 3.1$	8k	<sup>1</sup> AAIJ	15AB	LHCB	$p\bar{p}$ at 7, 8 TeV
$402 \pm 3^{+1}_{-3}$		<sup>2</sup> AALTONEN	14I	CDF	$p\bar{p}$ at 1.96 TeV

<sup>1</sup>AAIJ 15AB reports  $[m_{B_1^+} - m_{B^0}] - (m_{B^{*0}} - m_{B^0}) - m_{\pi^+} = 260.9 \pm 1.8 \pm 3.1$ MeV which we adjust by the  $\pi^+$  mass and assume  $(m_{B^{*0}} - m_{B^0}) = (m_{B^{*+}} - m_{B^+}) = 45.01 \pm 0.30 \pm 0.23$  MeV. The masses inside the square brackets were measured for each candidate event.<sup>2</sup>AALTONEN 14I reports  $m_{B_1(5721)^+} - m_{B^{*0}} - m_{\pi^+} = 262 \pm 3^{+1}_{-3}$  MeV which we adjusted by the  $\pi^+$  mass. **$B_1(5721)^0$  mass**

OUR FIT uses mass differences measurements listed below to determine the mass

 $m_{B_1(5721)^0}$ .

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>
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 **$5726.1 \pm 1.3$  OUR FIT** Error includes scale factor of 1.2. **$m_{B_1^0} - m_{B^+}$** 

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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 **$446.7 \pm 1.3$  OUR FIT** Error includes scale factor of 1.2. **$441.5 \pm 2.4 \pm 1.3$**  <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. • • •

 $446.2^{+1.9+1.0}_{-2.1-1.2}$  <sup>1</sup>AALTONEN 09D CDF Repl. by AALTONEN 14I<sup>1</sup>Observed in  $B_1^0 \rightarrow B^{*+} \pi^-$ . **$m_{B_1^0} - m_{B^{*+}}$** 

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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 **$401.4 \pm 1.2$  OUR FIT** Error includes scale factor of 1.2. **$402.8 \pm 1.1$  OUR AVERAGE**

403.4 ± 0.7 ± 1.5      35k      <sup>1</sup> AAIJ      15AB LHCb     $p\bar{p}$  at 7, 8 TeV  
 402.3 ± 0.9  $^{+1.1}_{-1.2}$       <sup>2</sup> AALTONEN    14l    CDF     $p\bar{p}$  at 1.96 TeV

<sup>1</sup> AAIJ 15AB reports  $[m_{B_1^0} - m_{B^+}] - (m_{B^{*+}} - m_{B^+}) - m_{\pi^-} = 263.9 \pm 0.7 \pm 1.4$

MeV which we adjust by the  $\pi^-$  mass and  $(m_{B^{*+}} - m_{B^+}) = 45.01 \pm 0.30 \pm 0.23$  MeV. The masses inside the square brackets were measured for each candidate event.

<sup>2</sup> AALTONEN 14l reports  $m_{B_1(5721)^0} - m_{B^{*+}} - m_{\pi^-} = 262.7 \pm 0.9  $^{+1.1}_{-1.2}$$  MeV which we adjusted by the  $\pi^-$  mass.

## $B_1(5721)$ WIDTH

### $B_1(5721)^+$ width

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>31 ± 6 OUR AVERAGE</b>				Error includes scale factor of 1.1.
29.1 ± 3.6 ± 4.3	8k	AAIJ	15AB LHCb	$p\bar{p}$ at 7, 8 TeV
49 $^{+12}_{-10}$ $^{+2}_{-13}$		AALTONEN	14l CDF	$p\bar{p}$ at 1.96 TeV

### $B_1(5721)^0$ width

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>27.5 ± 3.4 OUR AVERAGE</b>				Error includes scale factor of 1.1.
30.1 ± 1.5 ± 3.5	35k	AAIJ	15AB LHCb	$p\bar{p}$ at 7, 8 TeV
23 ± 3 ± 4		AALTONEN	14l CDF	$p\bar{p}$ at 1.96 TeV

## $B_1(5721)$ DECAY MODES

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

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

VALUE	DOCUMENT ID	TECN	CHG	COMMENT	$\Gamma_1/\Gamma$
seen	AAIJ	15AB LHCb	±0	$p\bar{p}$ at 7, 8 TeV	
<b>seen</b>	AALTONEN	14l CDF	±	$p\bar{p}$ at 1.96 TeV	
seen	AALTONEN	09D CDF	0	$p\bar{p}$ at 1.96 TeV	
<b>seen</b>	<sup>1</sup> ABAZOV	07T D0	0	$p\bar{p}$ at 1.96 TeV	

<sup>1</sup> Observed in  $B_1^0 \rightarrow B^{*+} \pi^-$  with  $B^{*+} \rightarrow B^+ \gamma$  and  $B^+ \rightarrow J/\psi \pi^+$ .

## $B_1(5721)$ REFERENCES

AAIJ	15AB JHEP 1504 024	R. Aaij <i>et al.</i>	(LHCb Collab.)
AALTONEN	14l 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.)