

$B_2^*(5747)$

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

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 |
|-----------------------------|-------------|
| 5737.2 ± 0.7 OUR FIT | |

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

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

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

²AALTONEN 14I reports $m_{B_2^*(5747)^+} - m_{B^0} - m_{\pi^+} = 317.7 \pm 1.2^{+0.3}_{-0.9}$ MeV which we adjusted by the π^+ mass.

 $B_2^*(5747)^0$ massOUR 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 |
|-----------------------------|-------------------------------------|
| 5739.5 ± 0.7 OUR FIT | Error includes scale factor of 1.4. |

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

| VALUE (MeV) | DOCUMENT ID | TECN | COMMENT |
|---|-------------------------------------|------|---------------------------|
| 13.4 ± 1.4 OUR FIT | Error includes scale factor of 1.3. | | |
| 26.2 ± 3.1 ± 0.9 | ¹ ABAZOV | 07T | D0 $p\bar{p}$ at 1.96 TeV |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | |
| 14.9 $^{+2.2+1.2}_{-2.5-1.4}$ | ¹ AALTONEN | 09D | CDF Repl. by AALTONEN 14I |

¹Observed 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 |
|--------------------------------|-------------------------------------|-------------|------|---------|
| 460.2 ± 0.6 OUR FIT | Error includes scale factor of 1.4. | | | |
| 459.9 ± 0.8 OUR AVERAGE | Error includes scale factor of 1.8. | | | |

460.18 ± 0.37 ± 0.33 17k ¹ AAIJ 15AB LHCB $p\bar{p}$ at 7, 8 TeV
 457.5 ± 1.2 $\begin{smallmatrix} +0.8 \\ -0.9 \end{smallmatrix}$ ² AALTONEN 14I CDF $p\bar{p}$ at 1.96 TeV

¹ 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 π^- mass. The masses inside the square brackets were measured for each candidate event.

² 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 π^- mass.

$B_2^*(5747)$ WIDTH

$B_2^*(5747)^+$ width

| VALUE (MeV) | EVTS | DOCUMENT ID | TECN | COMMENT |
|---|------|-------------------------------------|-----------|------------------------|
| 20 ± 5 OUR AVERAGE | | 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 |
|---|------|-------------|-----------|------------------------|
| 24.2 ± 1.7 OUR AVERAGE | | | | |
| 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

$B_2^*(5747)$ DECAY MODES

| Mode | Fraction (Γ_i/Γ) |
|---------------------|--------------------------------|
| Γ_1 $B\pi$ | seen |
| Γ_2 $B^*\pi$ | seen |

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

Γ_1/Γ

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

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

Γ_2/Γ

| VALUE | EVTS | DOCUMENT ID | TECN | CHG | COMMENT |
|-------------|--------|-------------|-----------|-----|------------------------|
| seen | 4k,17k | AAIJ | 15AB LHCB | ±0 | $p\bar{p}$ at 7, 8 TeV |
| seen | | AALTONEN | 09D CDF | 0 | $p\bar{p}$ at 1.96 TeV |
| seen | | ABAZOV | 07T D0 | 0 | $p\bar{p}$ at 1.96 TeV |

| $\Gamma(B^*\pi)/\Gamma(B\pi)$ | | Γ_2/Γ_1 | | | |
|--------------------------------|-------------|---------------------|-------------|------------|--|
| <u>VALUE</u> | <u>EVTS</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>CHG</u> | <u>COMMENT</u> |
| 0.84 ± 0.27 OUR AVERAGE | | | | | |
| 0.71 ± 0.14 ± 0.30 | 17k | AAIJ | 15AB LHCB | 0 | <i>pp</i> at 7, 8 TeV |
| 1.0 ± 0.5 ± 0.8 | 4k | AAIJ | 15AB LHCB | ± | <i>pp</i> at 7, 8 TeV |
| 1.10 ± 0.42 ± 0.31 | | ¹ ABAZOV | 07T D0 | 0 | <i>p\bar{p}</i> at 1.96 TeV |

¹ 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.) |