# $\Omega_b^-$

$I(J^P) = 0(\frac{1}{2}^+)$ Status: ***
$I$, $J$, $P$ need confirmation.

In the quark model $\Omega_b^-$ is $ssb$ ground state. None of its quantum numbers has been measured.

## $\Omega_b^-$ MASS

| *VALUE* (MeV) | *DOCUMENT ID* | *TECN* | *COMMENT* |
|---|---|---|---|
| **6071 ±40 OUR AVERAGE** | Error includes scale factor of 6.2. | | |
| 6054.4± 6.8± 0.9 | [1] AALTONEN | 09AP CDF | $p\overline{p}$ at 1.96 TeV |
| 6165 ±10 ±13 | [2] ABAZOV | 08AL D0 | $p\overline{p}$ at 1.96 TeV |

[1] Observed in $\Omega_b^- \to J/\psi\Omega^-$ decays with $16^{+6}_{-4}$ candidates, a significance of 5.5 sigma from a combined mass-lifetime fit.
[2] Observed in $\Omega_b^- \to J/\psi\Omega^-$ decays with $17.8 \pm 4.9 \pm 0.8$ candidates, a significance of 5.4 sigma.

## $\Omega_b$ MEAN LIFE

| *VALUE* ($10^{-12}$ s) | *DOCUMENT ID* | *TECN* | *COMMENT* |
|---|---|---|---|
| $\mathbf{1.13^{+0.53}_{-0.40}\pm0.02}$ | [3] AALTONEN | 09AP CDF | $p\overline{p}$ at 1.96 TeV |

[3] Observed in $\Omega_b^- \to J/\psi\Omega^-$ decays with $16^{+6}_{-4}$ candidates, a significance of 5.5 sigma from a combined mass-lifetime fit.

## $\Omega_b^-$ DECAY MODES

| | Mode | Fraction ($\Gamma_i/\Gamma$) |
|---|---|---|
| $\Gamma_1$ | $J/\psi\Omega^-\times$B($b \to \ \Omega_b$) | $(2.4\pm1.2)\times10^{-6}$ |

## $\Omega_b^-$ BRANCHING RATIOS

### $\Gamma(J/\psi\Omega^-\times$B($b\to\ \Omega_b$)$)/\Gamma_{\text{total}}$ $\Gamma_1/\Gamma$

| *VALUE* (units $10^{-4}$) | *DOCUMENT ID* | *TECN* | *COMMENT* |
|---|---|---|---|
| **0.024±0.012 OUR AVERAGE** | | | |
| $0.021^{+0.008}_{-0.006}\pm0.010$ | [4] AALTONEN | 09AP CDF | $p\overline{p}$ at 1.96 TeV |
| $0.065^{+0.029}_{-0.032}{}^{+0.035}_{-0.033}$ | [5] ABAZOV | 08AL D0 | $p\overline{p}$ at 1.96 TeV |

[4] AALTONEN 09AP reports $[\Gamma(\Omega_b^- \to \ J/\psi\Omega^-\times$B($b\to\ \Omega_b$) $)/\Gamma_{\text{total}}]$ / $[$B($\Lambda_b^0 \to$ $J/\psi(1S)\Lambda\times$ B($b\to\ \Lambda_b^0$) $)] = 0.045^{+0.017}_{-0.012} \pm 0.004$ which we multiply by our best value B($\Lambda_b^0 \to\ J/\psi(1S)\Lambda\times$ B($b\to\ \Lambda_b^0$) $) = (4.7 \pm 2.3)\times10^{-5}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[5] ABAZOV 08AL reports $[\Gamma(\Omega_b^- \rightarrow J/\psi\Omega^- \times \mathrm{B}(b \rightarrow \Omega_b^-))/\Gamma_{\mathrm{total}}]$ / $[\mathrm{B}(\Xi_b^- \rightarrow J/\psi\Xi^- \times \mathrm{B}(b \rightarrow \Xi_b^-))] = 0.80 \pm 0.32^{+0.14}_{-0.22}$ which we multiply by our best value $\mathrm{B}(\Xi_b^- \rightarrow J/\psi\Xi^- \times \mathrm{B}(b \rightarrow \Xi_b^-)) = (8 \pm 4) \times 10^{-6}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

## $\Omega_b^-$ REFERENCES


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|---|---|---|---|---|
| AALTONEN | 09AP | PR D80 072003 | T. Aaltonen *et al.* | (CDF Collab.) |
| ABAZOV | 08AL | PRL 101 232002 | V.M. Abazov *et al.* | (D0 Collab.) |