Λ_b^0

$I(J^P) = 0(\frac{1}{2}^+)$ Status: ∗∗∗

In the quark model, a Λ_b^0 is an isospin-0 $u\,d\,b$ state. The lowest Λ_b^0 ought to have $J^P = 1/2^+$. None of I, J, or P have actually been measured.

Λ_b^0 MASS

$m_{\Lambda_b^0}$

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
5619.60± 0.17 OUR AVERAGE					
5619.62± 0.16± 0.13		[1] AAIJ	17AM	LHCB	pp at 7, 8 TeV
5619.30± 0.34		[2] AAIJ	14AA	LHCB	pp at 7 TeV
5620.15± 0.31± 0.47		[3] AALTONEN	14B	CDF	$p\overline{p}$ at 1.96 TeV
5619.7 ± 0.7 ± 1.1		[3] AAD	13U	ATLS	pp at 7 TeV
5621 ± 4 ± 3		[4] ABE	97B	CDF	$p\overline{p}$ at 1.8 TeV
5668 ± 16 ± 8	4	[5] ABREU	96N	DLPH	$e^+e^- \rightarrow Z$
5614 ± 21 ± 4	4	[5] BUSKULIC	96L	ALEP	$e^+e^- \rightarrow Z$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
5619.65± 0.17± 0.17		[6] AAIJ	16Y	LHCB	Repl. by AAIJ 17AM
5619.44± 0.13± 0.38		[3] AAIJ	13AV	LHCB	Repl. by AAIJ 17AM
5619.19± 0.70± 0.30		[3] AAIJ	12E	LHCB	Repl. by AAIJ 13AV
5619.7 ± 1.2 ± 1.2		[7] ACOSTA	06	CDF	Repl. by AALTONEN 14B
not seen		[8] ABE	93B	CDF	Repl. by ABE 97B
5640 ± 50 ±30	16	[9] ALBAJAR	91E	UA1	$p\overline{p}$ 630 GeV
5640 $^{+100}_{-210}$	52	BARI	91	SFM	$\Lambda_b^0 \rightarrow pD^0\pi^-$
5650 $^{+150}_{-200}$	90	BARI	91	SFM	$\Lambda_b^0 \rightarrow \Lambda_c^+\pi^+\pi^-\pi^-$

[1] Uses $\Lambda_b^0 \rightarrow \chi_{c1}pK^-$, $\Lambda_b^0 \rightarrow \chi_{c2}pK^-$, $\Lambda_b^0 \rightarrow J/\psi\Lambda$, $\Lambda_b^0 \rightarrow p\psi(2S)K^-$, $\Lambda_b^0 \rightarrow pJ/\psi\pi^+\pi^-K^-$, and $\Lambda_b^0 \rightarrow pJ/\psi K^-$ decays.

[2] Uses exclusively reconstructed final states $\Lambda_b^0 \rightarrow \Lambda_c^+D_s^-$, $\Lambda_c^+D^-$ and $\overline{B}^0 \rightarrow D^+D_s^-$ decays. The uncertainty includes both statistical and systematic contributions.

[3] Uses $\Lambda_b^0 \rightarrow J/\psi\Lambda$ fully reconstructed decays.

[4] ABE 97B observed 38 events with a background of 18 ± 1.6 events in the mass range 5.60–5.65 GeV/c^2, a significance of > 3.4 standard deviations.

[5] Uses 4 fully reconstructed Λ_b events.

[6] Uses $\Lambda_b^0 \rightarrow p\psi(2S)K^-$, $\Lambda_b^0 \rightarrow pJ/\psi\pi^+\pi^-K^-$, and $\Lambda_b^0 \rightarrow pJ/\psi K^-$ decays.

[7] Uses exclusively reconstructed final states containing a $J/\psi \rightarrow \mu^+\mu^-$ decays.

[8] ABE 93B states that, based on the signal claimed by ALBAJAR 91E, CDF should have found 30 ± 23 $\Lambda_b^0 \rightarrow J/\psi(1S)\Lambda$ events. Instead, CDF found not more than 2 events.

[9] ALBAJAR 91E claims 16 ± 5 events above a background of 9 ± 1 events, a significance of about 5 standard deviations.

$m_{\Lambda_b^0} - m_{B^0}$

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
339.2±1.4±0.1	[1] ACOSTA	06	CDF	$p\overline{p}$ at 1.96 TeV

[1] Uses exclusively reconstructed final states containing $J/\psi \to \mu^+\mu^-$ decays.

$m_{\Lambda_b^0} - m_{B^+}$

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
339.72±0.28 OUR AVERAGE				
339.72±0.24±0.18	[1] AAIJ	14AA	LHCB	pp at 7 TeV
339.71±0.71±0.09	[2] AAIJ	12E	LHCB	pp at 7 TeV

[1] Uses exclusively reconstructed final states $\Lambda_b^0 \to \Lambda_c^+ D_s^-$, $\Lambda_c^+ D^-$ and $\overline{B}^0 \to D^+ D_s^-$ decays.

[2] Uses exclusively reconstructed final states containing $J/\psi \to \mu^+\mu^-$ decays.

Λ_b^0 MEAN LIFE

See b-baryon Admixture section for data on b-baryon mean life average over species of b-baryon particles.

"OUR EVALUATION" is an average using rescaled values of the data listed below. The average and rescaling were performed by the Heavy Flavor Averaging Group (HFLAV) and are described at https://hflav.web.cern.ch/. The averaging/rescaling procedure takes into account correlations between the measurements and asymmetric lifetime errors.

VALUE (10^{-12} s)	EVTS	DOCUMENT ID		TECN	COMMENT
1.471±0.009 OUR EVALUATION					
1.477±0.027±0.009		[1] SIRUNYAN	18BY	CMS	pp at 8 TeV
1.415±0.027±0.006		[2] AAIJ	14E	LHCB	pp at 7 TeV
1.479±0.009±0.010		[3] AAIJ	14U	LHCB	pp at 7, 8 TeV
1.565±0.035±0.020		[2] AALTONEN	14B	CDF	$p\overline{p}$ at 1.96 TeV
1.449±0.036±0.017		[2] AAD	13U	ATLS	pp at 7 TeV
1.503±0.052±0.031		[2] CHATRCHYAN	13AC	CMS	pp at 7 TeV
1.303±0.075±0.035		[2] ABAZOV	12U	D0	$p\overline{p}$ at 1.96 TeV
1.401±0.046±0.035		[4] AALTONEN	10B	CDF	$p\overline{p}$ at 1.96 TeV
$1.27\ ^{+0.35}_{-0.29}\ \pm0.09$		ABREU	95S	DLPH	Excess $p\mu^-$, decay lengths
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1.482±0.018±0.012		[5] AAIJ	13BB	LHCB	Repl. by AAIJ 14U
1.537±0.045±0.014		[2] AALTONEN	11	CDF	Repl. by AALTONEN 14B
$1.218\ ^{+0.130}_{-0.115}\ \pm0.042$		[2] ABAZOV	07S	D0	Repl. by ABAZOV 12U
$1.290\ ^{+0.119}_{-0.110}\ ^{+0.087}_{-0.091}$		[6] ABAZOV	07U	D0	$p\overline{p}$ at 1.96 TeV
$1.593\ ^{+0.083}_{-0.078}\ \pm0.033$		[2] ABULENCIA	07A	CDF	Repl. by AALTONEN 11
$1.22\ ^{+0.22}_{-0.18}\ \pm0.04$		[2] ABAZOV	05C	D0	Repl. by ABAZOV 07S
$1.11\ ^{+0.19}_{-0.18}\ \pm0.05$		[7] ABREU	99W	DLPH	$e^+e^- \to Z$

$1.29\ ^{+0.24}_{-0.22}\ \pm 0.06$		[7] ACKERSTAFF	98G	OPAL	$e^+e^- \to Z$
$1.21\ \pm 0.11$		[7] BARATE	98D	ALEP	$e^+e^- \to Z$
$1.32\ \pm 0.15\ \pm 0.07$		[8] ABE	96M	CDF	$p\overline{p}$ at 1.8 TeV
$1.19\ ^{+0.21}_{-0.18}\ ^{+0.07}_{-0.08}$		ABREU	96D	DLPH	Repl. by ABREU 99W
$1.14\ ^{+0.22}_{-0.19}\ \pm 0.07$	69	AKERS	95K	OPAL	Repl. by ACKERSTAFF 98G
$1.02\ ^{+0.23}_{-0.18}\ \pm 0.06$	44	BUSKULIC	95L	ALEP	Repl. by BARATE 98D

[1] Measured using $\Lambda_b^0 \to J/\psi \Lambda$ decays.

[2] Measured mean life using fully reconstructed $\Lambda_b^0 \to J/\psi \Lambda$ decays.

[3] Used $\Lambda_b^0 \to J/\psi p K^-$ decays.

[4] Measured mean life using fully reconstructed $\Lambda_b^0 \to \Lambda_c^+ \pi^-$ decays.

[5] Measured the lifetime ratio of decays $\Lambda_b^0 \to J/\psi p K^-$ to $B^0 \to J/\psi \pi^+ K^-$ to be $0.976 \pm 0.012 \pm 0.006$ with $\tau_{B^0} = 1.519 \pm 0.007$ ps.

[6] Measured using semileptonic decays $\Lambda_b^0 \to \Lambda_c^+ \mu \nu X$ and $\Lambda_c^+ \to K_S^0 p$.

[7] Measured using $\Lambda_c \ell^-$ and $\Lambda \ell^+ \ell^-$.

[8] Excess $\Lambda_c \ell^-$, decay lengths.

$\tau_{\Lambda_b^0} / \tau_{\overline{\Lambda}_b^0}$

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
0.940±0.035±0.006	[1] AAIJ	14E	LHCB	pp at 7 TeV

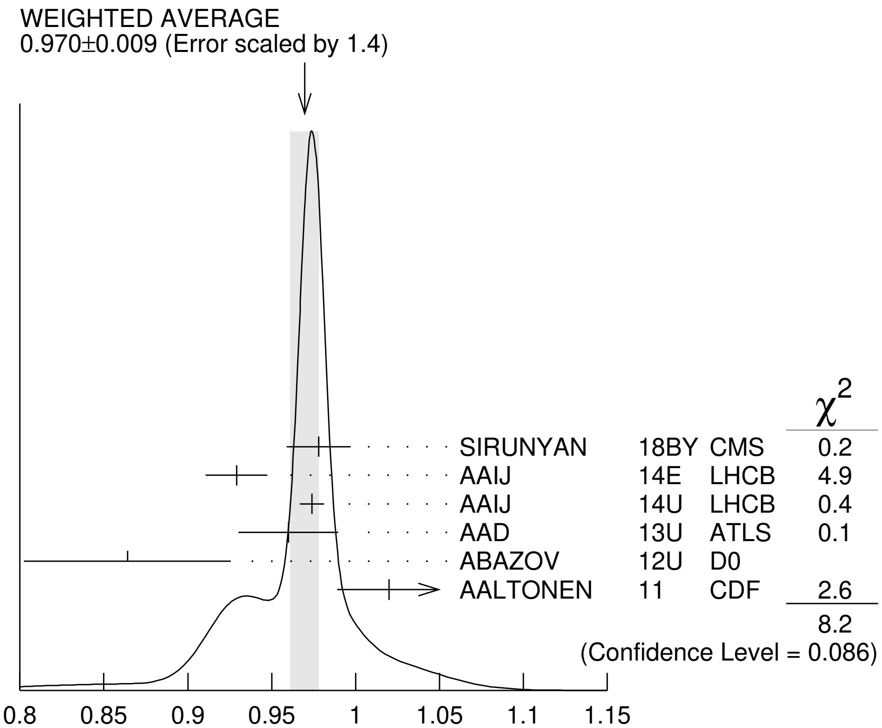
[1] Measured using $\Lambda_b^0 \to J/\psi \Lambda$ decays.

$\tau_{\Lambda_b^0} / \tau_{B^0}$ MEAN LIFE RATIO

$\tau_{\Lambda_b^0} / \tau_{B^0}$ (direct measurements)

"OUR EVALUATION" has been obtained by the Heavy Flavor Averaging Group (HFLAV) by including both B^0 and B^+ decays.

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
0.964±0.007 OUR EVALUATION				
0.970±0.009 OUR AVERAGE	Error includes scale factor of 1.4. See the ideogram below.			
$0.978 \pm 0.018 \pm 0.006$	[1] SIRUNYAN	18BY	CMS	pp at 8 TeV
$0.929 \pm 0.018 \pm 0.004$	[1] AAIJ	14E	LHCB	pp at 7 TeV
$0.974 \pm 0.006 \pm 0.004$	[2] AAIJ	14U	LHCB	pp at 7, 8 TeV
$0.960 \pm 0.025 \pm 0.016$	[3] AAD	13U	ATLS	pp at 7 TeV
$0.864 \pm 0.052 \pm 0.033$	[4,5] ABAZOV	12U	D0	$p\overline{p}$ at 1.96 TeV
$1.020 \pm 0.030 \pm 0.008$	[4] AALTONEN	11	CDF	$p\overline{p}$ at 1.96 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.976 \pm 0.012 \pm 0.006$	[6] AAIJ	13BB	LHCB	Repl. by AAIJ 14U
$0.811\ ^{+0.096}_{-0.087} \pm 0.034$	[4,5] ABAZOV	07S	D0	Repl. by ABAZOV 12U
1.041 ± 0.057	[7] ABULENCIA	07A	CDF	Repl. by AALTONEN 11
$0.87\ ^{+0.17}_{-0.14}\ \pm 0.03$	[7] ABAZOV	05C	D0	Repl. by ABAZOV 07S



[1] Measured using $\Lambda_b^0 \rightarrow J/\psi\Lambda$ and $B^0 \rightarrow J/\psi K^*(892)^0$ decays.
[2] Used $\Lambda_b^0 \rightarrow J/\psi p K^-$ and $B^0 \rightarrow J/\psi K^*(892)^0$ decays.
[3] Measured with $\Lambda_b^0 \rightarrow J/\psi(\mu^+\mu^-)\ \Lambda^0(p\pi^-)$ decays.
[4] Uses fully reconstructed $\Lambda_b \rightarrow J/\psi\Lambda$ decays.
[5] Uses $B^0 \rightarrow J/\psi K_S^0$ decays for denominator.
[6] Measures $1/\tau_{\Lambda_b^0} - 1/\tau_{B^0}$ and uses $\tau_{B^0} = 1.519 \pm 0.007$ ps to extract lifetime ratio.
[7] Measured mean life ratio using fully reconstructed decays.

$\tau_{\Lambda_b^0}/\tau_{B^0}$ (direct measurements)

Λ_b^0 DECAY MODES

The branching fractions B(b-baryon $\rightarrow \Lambda\ell^-\overline{\nu}_\ell$ anything) and B($\Lambda_b^0 \rightarrow \Lambda_c^+\ell^-\overline{\nu}_\ell$ anything) are not pure measurements because the underlying measured products of these with B($b \rightarrow b$-baryon) were used to determine B($b \rightarrow b$-baryon), as described in the note "Production and Decay of b-Flavored Hadrons."

For inclusive branching fractions, *e.g.*, $\Lambda_b \rightarrow \overline{\Lambda}_c$ anything, the values usually are multiplicities, not branching fractions. They can be greater than one.

	Mode	Fraction (Γ_i/Γ)	Scale factor/ Confidence level
Γ_1	$J/\psi(1S)\Lambda \times$ B($b \rightarrow \Lambda_b^0$)	$(5.8 \pm 0.8) \times 10^{-5}$	
Γ_2	$J/\psi(1S)\Lambda$		
Γ_3	$J/\psi(1S)\Lambda\phi$		

Γ_4	$\psi(2S)\Lambda$			
Γ_5	$p D^0 \pi^-$		$(6.3 \pm 0.6) \times 10^{-4}$	
Γ_6	$\Lambda_c(2860)^+ \pi^-$, $\Lambda_c^+ \to D^0 p$			
Γ_7	$\Lambda_c(2880)^+ \pi^-$, $\Lambda_c^+ \to D^0 p$			
Γ_8	$\Lambda_c(2940)^+ \pi^-$, $\Lambda_c^+ \to D^0 p$			
Γ_9	$p D^0 K^-$		$(4.6 \pm 0.8) \times 10^{-5}$	
Γ_{10}	$p D K^-$, $D \to K^- \pi^+$			
Γ_{11}	$p D K^-$, $D \to K^+ \pi^-$			
Γ_{12}	$p J/\psi \pi^-$		$(2.6\ {}^{+0.5}_{-0.4}) \times 10^{-5}$	
Γ_{13}	$p \pi^- J/\psi$, $J/\psi \to \mu^+ \mu^-$		$(1.6 \pm 0.8) \times 10^{-6}$	
Γ_{14}	$p J/\psi K^-$		$(3.2\ {}^{+0.6}_{-0.5}) \times 10^{-4}$	
Γ_{15}	$p \eta_c(1S) K^-$		$(1.06 \pm 0.26) \times 10^{-4}$	
Γ_{16}	$P_c(4312)^+ K^-$, $P_c(4312)^+ \to p \eta_c(1S)$		$< 2.5 \times 10^{-5}$	CL=95%
Γ_{17}	$P_c(4380)^+ K^-$, $P_c \to p J/\psi$	[a]	$(2.7 \pm 1.4) \times 10^{-5}$	
Γ_{18}	$P_c(4450)^+ K^-$, $P_c \to p J/\psi$	[a]	$(1.3 \pm 0.4) \times 10^{-5}$	
Γ_{19}	$\chi_{c1}(1P) p K^-$		$(7.6\ {}^{+1.5}_{-1.3}) \times 10^{-5}$	
Γ_{20}	$\chi_{c1}(1P) p \pi^-$		$(5.0\ {}^{+1.3}_{-1.1}) \times 10^{-6}$	
Γ_{21}	$\chi_{c2}(1P) p K^-$		$(7.9\ {}^{+1.6}_{-1.4}) \times 10^{-5}$	
Γ_{22}	$\chi_{c2}(1P) p \pi^-$		$(4.8 \pm 1.9) \times 10^{-6}$	
Γ_{23}	$p J/\psi(1S) \pi^+ \pi^- K^-$		$(6.6\ {}^{+1.3}_{-1.1}) \times 10^{-5}$	
Γ_{24}	$p \psi(2S) K^-$		$(6.6\ {}^{+1.2}_{-1.0}) \times 10^{-5}$	
Γ_{25}	$\chi_{c1}(3872) p K^-$		$(3.2 \pm 1.4) \times 10^{-5}$	
Γ_{26}	$\chi_{c1}(3872) \Lambda(1520)$		$(1.9 \pm 0.9) \times 10^{-5}$	
Γ_{27}	$\psi(2S) p \pi^-$		$(7.5\ {}^{+1.6}_{-1.4}) \times 10^{-6}$	
Γ_{28}	$p \overline{K}^0 \pi^-$		$(1.3 \pm 0.4) \times 10^{-5}$	
Γ_{29}	$p K^0 K^-$		$< 3.5 \times 10^{-6}$	CL=90%
Γ_{30}	$\Lambda_c^+ \pi^-$		$(4.9 \pm 0.4) \times 10^{-3}$	S=1.2
Γ_{31}	$\Lambda_c^+ K^-$		$(3.56 \pm 0.28) \times 10^{-4}$	S=1.2
Γ_{32}	$\Lambda_c^+ a_1(1260)^-$		seen	
Γ_{33}	$\Lambda_c^+ D^-$		$(4.6 \pm 0.6) \times 10^{-4}$	
Γ_{34}	$\Lambda_c^+ D_s^-$		(1.10 ± 0.10) %	
Γ_{35}	$\Lambda_c^+ \pi^+ \pi^- \pi^-$		$(7.6 \pm 1.1) \times 10^{-3}$	S=1.1
Γ_{36}	$\Lambda_c(2595)^+ \pi^-$, $\Lambda_c(2595)^+ \to \Lambda_c^+ \pi^+ \pi^-$		$(3.4 \pm 1.4) \times 10^{-4}$	
Γ_{37}	$\Lambda_c(2625)^+ \pi^-$, $\Lambda_c(2625)^+ \to \Lambda_c^+ \pi^+ \pi^-$		$(3.3 \pm 1.3) \times 10^{-4}$	

Γ_{38}	$\Sigma_c(2455)^0 \pi^+ \pi^-$, $\Sigma_c^0 \to \Lambda_c^+ \pi^-$		$(5.7 \pm 2.2) \times 10^{-4}$	
Γ_{39}	$\Sigma_c(2455)^{++} \pi^- \pi^-$, $\Sigma_c^{++} \to \Lambda_c^+ \pi^+$		$(3.2 \pm 1.5) \times 10^{-4}$	
Γ_{40}	$\Lambda_c^+ K^+ K^- \pi^-$		$(1.02 \pm 0.11) \times 10^{-3}$	
Γ_{41}	$\Lambda_c^+ p \overline{p} \pi^-$		$(2.63 \pm 0.27) \times 10^{-4}$	
Γ_{42}	$\Sigma_c(2455)^0 p \overline{p}$, $\Sigma_c^0 \to \Lambda_c^+ \pi^-$		$(2.3 \pm 0.5) \times 10^{-5}$	
Γ_{43}	$\Sigma_c(2520)^0 p \overline{p}$, $\Sigma_c(2520)^0 \to \Lambda_c^+ \pi^-$		$(3.1 \pm 0.7) \times 10^{-5}$	
Γ_{44}	$\Lambda K^0 2\pi^+ 2\pi^-$			
Γ_{45}	$\Lambda_c^+ \ell^- \overline{\nu}_\ell$ anything	[b]	(10.9 ± 2.2) %	
Γ_{46}	$\Lambda_c^+ \ell^- \overline{\nu}_\ell$		$(6.2 \,^{+1.4}_{-1.3})$ %	
Γ_{47}	$\Lambda_c^+ \pi^+ \pi^- \ell^- \overline{\nu}_\ell$		(5.6 ± 3.1) %	
Γ_{48}	$\Lambda_c(2595)^+ \ell^- \overline{\nu}_\ell$		$(7.9 \,^{+4.0}_{-3.5}) \times 10^{-3}$	
Γ_{49}	$\Lambda_c(2625)^+ \ell^- \overline{\nu}_\ell$		$(1.3 \,^{+0.6}_{-0.5})$ %	
Γ_{50}	$\Sigma_c(2455)^0 \pi^+ \ell^- \overline{\nu}_\ell$			
Γ_{51}	$\Sigma_c(2455)^{++} \pi^- \ell^- \overline{\nu}_\ell$			
Γ_{52}	$p h^-$	[c]	$< 2.3 \times 10^{-5}$	CL=90%
Γ_{53}	$p \pi^-$		$(4.5 \pm 0.8) \times 10^{-6}$	
Γ_{54}	$p K^-$		$(5.4 \pm 1.0) \times 10^{-6}$	
Γ_{55}	$p D_s^-$		$< 4.8 \times 10^{-4}$	CL=90%
Γ_{56}	$p \mu^- \overline{\nu}_\mu$		$(4.1 \pm 1.0) \times 10^{-4}$	
Γ_{57}	$\Lambda \mu^+ \mu^-$		$(1.08 \pm 0.28) \times 10^{-6}$	
Γ_{58}	$p \pi^- \mu^+ \mu^-$		$(6.9 \pm 2.5) \times 10^{-8}$	
Γ_{59}	$p K^- e^+ e^-$		$(3.1 \pm 0.6) \times 10^{-7}$	
Γ_{60}	$p K^- \mu^+ \mu^-$		$(2.6 \,^{+0.5}_{-0.4}) \times 10^{-7}$	
Γ_{61}	$\Lambda \gamma$		$(7.1 \pm 1.7) \times 10^{-6}$	
Γ_{62}	$\Lambda \eta$		$(9 \,^{+7}_{-5}) \times 10^{-6}$	
Γ_{63}	$\Lambda \eta'(958)$		$< 3.1 \times 10^{-6}$	CL=90%
Γ_{64}	$\Lambda \pi^+ \pi^-$		$(4.6 \pm 1.9) \times 10^{-6}$	
Γ_{65}	$\Lambda K^+ \pi^-$		$(5.6 \pm 1.2) \times 10^{-6}$	
Γ_{66}	$\Lambda K^+ K^-$		$(1.60 \pm 0.22) \times 10^{-5}$	
Γ_{67}	$\Lambda \phi$		$(9.8 \pm 2.6) \times 10^{-6}$	
Γ_{68}	$p \pi^- \pi^+ \pi^-$		$(2.10 \pm 0.22) \times 10^{-5}$	
Γ_{69}	$p K^- K^+ \pi^-$		$(4.0 \pm 0.6) \times 10^{-6}$	
Γ_{70}	$p K^- \pi^+ \pi^-$		$(5.0 \pm 0.5) \times 10^{-5}$	
Γ_{71}	$p K^- K^+ K^-$		$(1.26 \pm 0.13) \times 10^{-5}$	

[a] P_c^+ is a pentaquark-charmonium state.

[b] Not a pure measurement. See note at head of Λ_b^0 Decay Modes.

[c] Here h^- means π^- or K^-.

CONSTRAINED FIT INFORMATION

An overall fit to 10 branching ratios uses 12 measurements and one constraint to determine 7 parameters. The overall fit has a $\chi^2 = 10.8$ for 6 degrees of freedom.

The following *off-diagonal* array elements are the correlation coefficients $\left\langle\delta x_i\delta x_j\right\rangle/(\delta x_i\cdot\delta x_j)$, in percent, from the fit to the branching fractions, $x_i \equiv \Gamma_i/\Gamma_{\text{total}}$. The fit constrains the x_i whose labels appear in this array to sum to one.

x_{31}	92				
x_{35}	46	43			
x_{46}	13	12	6		
x_{53}	0	0	0	0	
x_{54}	0	0	0	0	82
	x_{30}	x_{31}	x_{35}	x_{46}	x_{53}

Λ_b^0 BRANCHING RATIOS

$\Gamma(J/\psi(1S)\Lambda \times B(b\to \Lambda_b^0))/\Gamma_{\text{total}}$ — Γ_1/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
5.8 ± 0.8 OUR AVERAGE					
6.01 ± 0.60 ± 0.58 ± 0.28		[1] ABAZOV	11O	D0	$p\overline{p}$ at 1.96 TeV
4.7 ± 2.3 ± 0.2		[2] ABE	97B	CDF	$p\overline{p}$ at 1.8 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
180 ±60 ±90	16	ALBAJAR	91E	UA1	$p\overline{p}$ at 630 GeV

[1] ABAZOV 11O uses $B(B^0 \to J/\psi K^0_S) \times B(b \to B^0) = (1.74 \pm 0.08) \times 10^{-4}$ to obtain the result. The $(\pm 0.08) \times 10^{-4}$ uncertainty of this product is listed as the last uncertainty of the measurement, $(\pm 0.28) \times 10^{-5}$.

[2] ABE 97B reports $[B(\Lambda_b^0 \to J/\psi\Lambda) \times B(b \to \Lambda_b^0)] / [B(B^0 \to J/\psi K^0_S) \times B(b \to B^0)] = 0.27 \pm 0.12 \pm 0.05$. We multiply by our best value $B(B^0 \to J/\psi K^0_S) \times B(b \to B^0) = (1.74 \pm 0.08) \times 10^{-4}$. Our first error is their experiment error and our second error is the systematic error from using our best value.

$\Gamma(\psi(2S)\Lambda)/\Gamma(J/\psi(1S)\Lambda)$ — Γ_4/Γ_2

VALUE	DOCUMENT ID		TECN	COMMENT
0.508±0.023 OUR AVERAGE				
0.513±0.023±0.019	[1] AAIJ	19F	LHCB	pp at 7, 8 TeV
0.50 ±0.03 ±0.02	[2] AAD	15CH	ATLS	pp at 8 TeV

[1] AAIJ 19F uses $B(J/\psi \to \mu^+\mu^-) = (5.961 \pm 0.033) \times 10^{-2}$ and $B(\psi(2S) \to e^+e^-) = (7.93 \pm 0.17) \times 10^{-3}$ from PDG 18 with assumption of lepton universality. AAIJ 19F

reports this result as 0.513 ± 0.023 ± 0.016 ± 0.011, where the last uncertainty is the contribution due to the external input of branching fractions used in the analysis.

[2] AAD 15CH uses B($J/\psi \to \mu^+\mu^-$) = $(5.961 \pm 0.033) \times 10^{-2}$ and B($\psi(2S) \to \mu^+\mu^-$)= $(7.89 \pm 0.17) \times 10^{-3}$ from PDG 14 with assumption of lepton universality.

$\Gamma(J/\psi(1S)\Lambda\phi)/\Gamma(\psi(2S)\Lambda)$ — Γ_3/Γ_4

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
8.26±0.90±0.69	SIRUNYAN	20H	CMS	pp at 13 TeV

$\Gamma(pD^0\pi^-)/\Gamma_{total}$ — Γ_5/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
seen	52	BARI	91	SFM	$D^0 \to K^-\pi^+$
seen		BASILE	81	SFM	$D^0 \to K^-\pi^+$

$\Gamma(\Lambda_c(2860)^+\pi^-,\ \Lambda_c^+ \to D^0 p)/\Gamma(\Lambda_c(2880)^+\pi^-,\ \Lambda_c^+ \to D^0 p)$ — Γ_6/Γ_7

VALUE	DOCUMENT ID		TECN	COMMENT
$\mathbf{4.54^{+0.51}_{-0.39}{}^{+0.21}_{-0.59}}$	AAIJ	17S	LHCB	pp at 7, 8 TeV

$\Gamma(\Lambda_c(2940)^+\pi^-,\ \Lambda_c^+ \to D^0 p)/\Gamma(\Lambda_c(2880)^+\pi^-,\ \Lambda_c^+ \to D^0 p)$ — Γ_8/Γ_7

VALUE	DOCUMENT ID		TECN	COMMENT
$\mathbf{0.83^{+0.31}_{-0.10}{}^{+0.18}_{-0.43}}$	AAIJ	17S	LHCB	pp at 7, 8 TeV

$\Gamma(pD^0K^-)/\Gamma(pD^0\pi^-)$ — Γ_9/Γ_5

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
$\mathbf{7.3 \pm 0.8^{+0.5}_{-0.6}}$	AAIJ	14H	LHCB	pp at 7 TeV

$\Gamma(pDK^-,\ D \to K^-\pi^+)/\Gamma(pDK^-,\ D \to K^+\pi^-)$ — Γ_{10}/Γ_{11}

VALUE	DOCUMENT ID		TECN	COMMENT
$\mathbf{7.1 \pm 0.8^{+0.4}_{-0.3}}$	[1] AAIJ	21AD	LHCB	pp at 7, 8, 13 TeV

[1] Measured in the full phase space.

$\Gamma(pJ/\psi\pi^-)/\Gamma(pJ/\psi K^-)$ — Γ_{12}/Γ_{14}

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
8.24±0.25±0.42	AAIJ	14K	LHCB	pp at 7, 8 TeV

$\Gamma(pJ/\psi K^-)/\Gamma_{total}$ — Γ_{14}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
$\mathbf{3.17 \pm 0.04^{+0.57}_{-0.45}}$	[1] AAIJ	16A	LHCB	pp at 7, 8 TeV

[1] AAIJ 16A reported the measurement of $(3.17 \pm 0.04 \pm 0.07 \pm 0.34^{+0.45}_{-0.28}) \times 10^{-4}$ where the first uncertainty is statistical, the second is systematic, the third is due to the branching fraction of $B^0 \to J/\psi K^*(892)^0$, and the fourth is due to the knowledge of f_{Λ_b}/f_d. We combined in quadrature second to fourth uncertainties to a total systematic uncertainty.

$\Gamma(p\eta_c(1S)K^-)/\Gamma(pJ/\psi K^-)$ — Γ_{15}/Γ_{14}

VALUE	DOCUMENT ID		TECN	COMMENT
0.333±0.050±0.037	[1] AAIJ	20AK	LHCB	pp at 13 TeV

[1] AAIJ 20AK reported the measurement of $0.333 \pm 0.050 \pm 0.019 \pm 0.032$, where the last uncertainty is due uncertainties of the used branching fractions of $J/\psi \to p\overline{p}$ and $\eta_c \to p\overline{p}$ decays. We combined in quadrature the systematic uncertainties.

$\Gamma(P_c(4312)^+K^-,\ P_c(4312)^+ \to p\eta_c(1S))/\Gamma(p\eta_c(1S)K^-)$ — Γ_{16}/Γ_{15}

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.24	95	AAIJ	20AK	LHCB	pp at 13 TeV

$\Gamma(P_c(4380)^+K^-,\ P_c \to pJ/\psi)/\Gamma_{\text{total}}$ — Γ_{17}/Γ

P_c^+ is a pentaquark-charmonium state.

VALUE (units 10^{-5})	DOCUMENT ID		TECN	COMMENT
$\mathbf{2.66 \pm 0.22^{+1.41}_{-1.38}}$	[1] AAIJ	16A	LHCB	pp at 7, 8 TeV

[1] AAIJ 16 total systematic includes the uncertainties on f(P_c^+) and B($\Lambda_b \to pJ/\psi K^-$).

$\Gamma(P_c(4450)^+K^-,\ P_c \to pJ/\psi)/\Gamma_{\text{total}}$ — Γ_{18}/Γ

P_c^+ is a pentaquark-charmonium state.

VALUE (units 10^{-5})	DOCUMENT ID		TECN	COMMENT
$\mathbf{1.30 \pm 0.16^{+0.42}_{-0.39}}$	[1] AAIJ	16A	LHCB	pp at 7, 8 TeV

[1] AAIJ 16 total systematic includes the uncertainties on f(P_c^+) and B($\Lambda_b \to pJ/\psi K^-$).

$\Gamma(\chi_{c1}(1P)pK^-)/\Gamma(pJ/\psi K^-)$ — Γ_{19}/Γ_{14}

VALUE	DOCUMENT ID		TECN	COMMENT
0.239±0.019±0.007	[1] AAIJ	17AM	LHCB	pp at 7, 8 TeV

[1] AAIJ 17AM reports $0.242 \pm 0.014 \pm 0.016$ from a measurement of $[\Gamma(\Lambda_b^0 \to \chi_{c1}(1P)pK^-)/\Gamma(\Lambda_b^0 \to pJ/\psi K^-)] \times [B(\chi_{c1}(1P) \to \gamma J/\psi(1S))]$ assuming $B(\chi_{c1}(1P) \to \gamma J/\psi(1S)) = (33.9 \pm 1.2) \times 10^{-2}$, which we rescale to our best value $B(\chi_{c1}(1P) \to \gamma J/\psi(1S)) = (34.3 \pm 1.0) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\chi_{c1}(1P)p\pi^-)/\Gamma(\chi_{c1}(1P)pK^-)$ — Γ_{20}/Γ_{19}

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
6.59±1.01±0.22	AAIJ	21R	LHCB	pp at 13 TeV

$\Gamma(\chi_{c2}(1P)pK^-)/\Gamma(pJ/\psi K^-)$ — Γ_{21}/Γ_{14}

VALUE	DOCUMENT ID		TECN	COMMENT
0.250±0.025±0.007	[1] AAIJ	17AM	LHCB	pp at 7, 8 TeV

[1] AAIJ 17AM reports $0.248 \pm 0.02 \pm 0.017$ from a measurement of $[\Gamma(\Lambda_b^0 \to \chi_{c2}(1P)pK^-)/\Gamma(\Lambda_b^0 \to pJ/\psi K^-)] \times [B(\chi_{c2}(1P) \to \gamma J/\psi(1S))]$ assuming $B(\chi_{c2}(1P) \to \gamma J/\psi(1S)) = (19.2 \pm 0.7) \times 10^{-2}$, which we rescale to our best value $B(\chi_{c2}(1P) \to \gamma J/\psi(1S)) = (19.0 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\chi_{c2}(1P)pK^-)/\Gamma(\chi_{c1}(1P)pK^-)$ — Γ_{21}/Γ_{19}

VALUE	DOCUMENT ID	TECN	COMMENT
1.06±0.05±0.04±0.04	[1] AAIJ 21R	LHCB	pp at 13 TeV

[1] The first uncertainty is statistical, the second is systematic and the third is related to the uncertainties in the branching fractions of the $\chi_{cJ} \rightarrow J/\psi\gamma$ decays.

$\Gamma(\chi_{c2}(1P)p\pi^-)/\Gamma(\chi_{c1}(1P)p\pi^-)$ — Γ_{22}/Γ_{20}

VALUE	DOCUMENT ID	TECN	COMMENT
0.95±0.30±0.04±0.04	[1] AAIJ 21R	LHCB	pp at 13 TeV

[1] Evidence for the $\Lambda_b^0 \rightarrow \chi_{c2}p\pi^-$ decay is obtained with a significance of 3.5 standard deviations. The first uncertainty is statistical, the second is systematic and the third is related to the uncertainties in the branching fractions of the $\chi_{cJ} \rightarrow J/\psi\gamma$ decays.

$\Gamma(pJ/\psi(1S)\pi^+\pi^-K^-)/\Gamma(pJ/\psi K^-)$ — Γ_{23}/Γ_{14}

VALUE	DOCUMENT ID	TECN	COMMENT
0.2086±0.0096±0.0134	[1] AAIJ 16Y	LHCB	pp at 7, 8 TeV

[1] Excludes $\psi(2S) \rightarrow J/\psi\pi^+\pi^-$.

$\Gamma(p\psi(2S)K^-)/\Gamma(pJ/\psi K^-)$ — Γ_{24}/Γ_{14}

VALUE	DOCUMENT ID	TECN	COMMENT
0.2070±0.0076±0.0059	[1] AAIJ 16Y	LHCB	pp at 7, 8 TeV

[1] AAIJ 16Y reports a measurement of $0.2070 \pm 0.0076 \pm 0.0046 \pm 0.0037$ where the third uncertainty is due to the knowledge of J/ψ and $\psi(2S)$ branching fractions. We have combined both systematic uncertainties in quadrature.

$\Gamma(\chi_{c1}(3872)\Lambda(1520))/\Gamma(\chi_{c1}(3872)pK^-)$ — Γ_{26}/Γ_{25}

VALUE	DOCUMENT ID	TECN	COMMENT
0.58±0.15	AAIJ 19AN	LHCB	pp at 7, 8, 13 TeV

$\Gamma(\chi_{c1}(3872)pK^-)/\Gamma(p\psi(2S)K^-)$ — Γ_{25}/Γ_{24}

VALUE	DOCUMENT ID	TECN	COMMENT
0.49±0.10±0.16	[1] AAIJ 19AN	LHCB	pp at 7, 8, 13 TeV

[1] AAIJ 19AN reports $[\Gamma(\Lambda_b^0 \rightarrow \chi_{c1}(3872)pK^-)/\Gamma(\Lambda_b^0 \rightarrow p\psi(2S)K^-)] \times [B(\chi_{c1}(3872) \rightarrow \pi^+\pi^-J/\psi(1S))] / [B(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-)] = (5.4 \pm 1.1 \pm 0.2) \times 10^{-2}$ which we multiply or divide by our best values $B(\chi_{c1}(3872) \rightarrow \pi^+\pi^-J/\psi(1S)) = (3.8 \pm 1.2) \times 10^{-2}$, $B(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-) = (34.68 \pm 0.30) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best values.

$\Gamma(\psi(2S)p\pi^-)/\Gamma(p\psi(2S)K^-)$ — Γ_{27}/Γ_{24}

VALUE (%)	DOCUMENT ID	TECN	COMMENT
11.4±1.3±0.2	AAIJ 18AF	LHCB	pp at 7, 8, 13 TeV

$\Gamma(p\overline{K}^0\pi^-)/\Gamma_{total}$ — Γ_{28}/Γ

VALUE (units 10^{-5})	DOCUMENT ID	TECN	COMMENT
1.26±0.19±0.36	[1] AAIJ 14Q	LHCB	pp at 7 TeV

[1] Used the normalizing mode branching fraction value of $B(B^0 \rightarrow K^0\pi^+\pi^-) = (4.96 \pm 0.20) \times 10^{-5}$.

$\Gamma(pK^0K^-)/\Gamma_{total}$ Γ_{29}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<3.5 × 10^{-6}	90	AAIJ	14Q	LHCB	pp at 7 TeV

$\Gamma(\Lambda_c^+\pi^-)/\Gamma_{total}$ Γ_{30}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
4.9 ±0.4 OUR FIT Error includes scale factor of 1.2.					
4.8 ±0.5 OUR AVERAGE Error includes scale factor of 1.5.					
$4.60^{+0.31}_{-0.30}\pm0.14$		[1] AAIJ	14I	LHCB	pp at 7 TeV
$5.97\pm0.28\pm0.81$		[2] AAIJ	14Q	LHCB	pp at 7 TeV
$8.8\ \pm2.8\ \pm1.5$		[3] ABULENCIA	07B	CDF	$p\overline{p}$ at 1.96 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
seen	3	ABREU	96N	DLPH	$\Lambda_c^+ \to pK^-\pi^+$
seen	4	BUSKULIC	96L	ALEP	$\Lambda_c^+ \to pK^-\pi^+$, $p\overline{K}^0$, $\Lambda\pi^+\pi^+\pi^-$

[1] AAIJ 14I reports $(4.30 \pm 0.03^{+0.12}_{-0.11} \pm 0.26 \pm 0.21) \times 10^{-3}$ from a measurement of $[\Gamma(\Lambda_b^0 \to \Lambda_c^+\pi^-)/\Gamma_{total}] \times [B(B^0 \to D^-\pi^+)]$ assuming $B(B^0 \to D^-\pi^+) = (2.68 \pm 0.13) \times 10^{-3}$, which we rescale to our best value $B(B^0 \to D^-\pi^+) = (2.51 \pm 0.08) \times 10^{-3}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Uses information on f_{baryon}/f_d from measurement in semileptonic decays by the same authors.

[2] Obtained using the branching fraction of $\Lambda_c^+ \to pK^-\pi^+$ decay.

[3] The result is obtained from (f_{baryon}/f_d) $(B(\Lambda_b^0 \to \Lambda_c^+\pi^-)/B(\overline{B}^0 \to D^+\pi^-)) = 0.82 \pm 0.08 \pm 0.11 \pm 0.22$, assuming $f_{baryon}/f_d = 0.25 \pm 0.04$ and $B(\overline{B}^0 \to D^+\pi^-) = (2.68 \pm 0.13) \times 10^{-3}$.

$\Gamma(pD^0\pi^-)/\Gamma(\Lambda_c^+\pi^-)$ Γ_5/Γ_{30}

VALUE	DOCUMENT ID		TECN	COMMENT
$\mathbf{0.128\pm0.007^{+0.006}_{-0.007}}$	[1] AAIJ	14H	LHCB	pp at 7 TeV

[1] AAIJ 14H reports $[\Gamma(\Lambda_b^0 \to pD^0\pi^-)/\Gamma(\Lambda_b^0 \to \Lambda_c^+\pi^-)] \times [B(D^0 \to K^-\pi^+)] / [B(\Lambda_c^+ \to pK^-\pi^+)] = (8.06 \pm 0.23 \pm 0.35) \times 10^{-2}$ which we multiply or divide by our best values $B(D^0 \to K^-\pi^+) = (3.947 \pm 0.030) \times 10^{-2}$, $B(\Lambda_c^+ \to pK^-\pi^+) = (6.28 \pm 0.32) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best values.

$\Gamma(\Lambda_c^+K^-)/\Gamma_{total}$ Γ_{31}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
3.56±0.28 OUR FIT Error includes scale factor of 1.2.				
3.55±0.44±0.50	[1] AAIJ	14Q	LHCB	pp at 7 TeV

[1] Obtained using the branching fraction of $\Lambda_c^+ \to pK^-\pi^+$ decay.

$\Gamma(\Lambda_c^+K^-)/\Gamma(\Lambda_c^+\pi^-)$ Γ_{31}/Γ_{30}

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
7.31±0.22 OUR FIT				
7.31±0.16±0.16	AAIJ	14H	LHCB	pp at 7 TeV

$\Gamma(\Lambda_c^+ a_1(1260)^-)/\Gamma_{\rm total}$ — Γ_{32}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
seen	1	ABREU	96N	DLPH	$\Lambda_c^+ \to pK^-\pi^+$, $a_1^- \to \rho^0\pi^- \to \pi^+\pi^-\pi^-$

$\Gamma(\Lambda_c^+ D_s^-)/\Gamma_{\rm total}$ — Γ_{34}/Γ

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
1.1±0.1	[1] AAIJ	14AA	LHCB	pp at 7 TeV

[1] Uses $B(\overline{B}^0 \to D^+ D_s^-) = (7.2 \pm 0.8) \times 10^{-3}$ and their measured $B(\Lambda_b^0 \to \Lambda_c^+\pi^-))/B(\overline{B}^0 \to D^+\pi^-)$ values.

$\Gamma(\Lambda_c^+ D^-)/\Gamma(\Lambda_c^+ D_s^-)$ — Γ_{33}/Γ_{34}

VALUE	DOCUMENT ID		TECN	COMMENT
0.042±0.003±0.003	AAIJ	14AA	LHCB	pp at 7 TeV

$\Gamma(\Lambda_c^+ \pi^+\pi^-\pi^-)/\Gamma_{\rm total}$ — Γ_{35}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
7.6±1.1 OUR FIT Error includes scale factor of 1.1.					
$14.8^{+3.8}_{-3.1}\pm1.1$		[1] AALTONEN	12A	CDF	$p\overline{p}$ at 1.96 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
seen	90	BARI	91	SFM	$\Lambda_c^+ \to pK^-\pi^+$

[1] AALTONEN 12A reports $[\Gamma(\Lambda_b^0 \to \Lambda_c^+\pi^+\pi^-\pi^-)/\Gamma_{\rm total}] / [B(\Lambda_b^0 \to \Lambda_c^+\pi^-)] = 3.04 \pm 0.33^{+0.70}_{-0.55}$ which we multiply by our best value $B(\Lambda_b^0 \to \Lambda_c^+\pi^-) = (4.9 \pm 0.4) \times 10^{-3}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\Lambda_c^+ \pi^+\pi^-\pi^-)/\Gamma(\Lambda_c^+\pi^-)$ — Γ_{35}/Γ_{30}

VALUE	DOCUMENT ID		TECN	COMMENT
1.57±0.21 OUR FIT				
1.43±0.16±0.13	AAIJ	11E	LHCB	pp at 7 TeV

$\Gamma(\Lambda_c(2595)^+\pi^-, \Lambda_c(2595)^+ \to \Lambda_c^+\pi^+\pi^-)/\Gamma(\Lambda_c^+\pi^+\pi^-\pi^-)$ — Γ_{36}/Γ_{35}

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
$4.4\pm1.7^{+0.6}_{-0.4}$	AAIJ	11E	LHCB	pp at 7 TeV

$\Gamma(\Lambda_c(2625)^+\pi^-, \Lambda_c(2625)^+ \to \Lambda_c^+\pi^+\pi^-)/\Gamma(\Lambda_c^+\pi^+\pi^-\pi^-)$ — Γ_{37}/Γ_{35}

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
4.3±1.5±0.4	AAIJ	11E	LHCB	pp at 7 TeV

$\Gamma(\Sigma_c(2455)^0\pi^+\pi^-, \Sigma_c^0 \to \Lambda_c^+\pi^-)/\Gamma(\Lambda_c^+\pi^+\pi^-\pi^-)$ — Γ_{38}/Γ_{35}

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
7.4±2.4±1.2	AAIJ	11E	LHCB	pp at 7 TeV

$\Gamma\big(\Sigma_c(2455)^{++}\pi^-\pi^-, \Sigma_c^{++}\to\Lambda_c^+\pi^+\big)/\Gamma\big(\Lambda_c^+\pi^+\pi^-\pi^-\big)$ Γ_{39}/Γ_{35}

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
4.2±1.8±0.7	AAIJ	11E	LHCB	pp at 7 TeV

$\Gamma\big(\Lambda_c^+ K^+ K^- \pi^-\big)/\Gamma\big(\Lambda_c^+ D_s^-\big)$ Γ_{40}/Γ_{34}

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
9.26±0.29±0.53	[1] AAIJ	21B	LHCB	pp at 7 and 8 TeV

[1] AAIJ 21B systematic uncertainty includes the contribution from the $D_s^- \to K^+ K^- \pi^-$ branching fraction.

$\Gamma\big(\Lambda_c^+ p\overline{p}\pi^-\big)/\Gamma\big(\Lambda_c^+\pi^-\big)$ Γ_{41}/Γ_{30}

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
5.40±0.23±0.32	AAIJ	18AW	LHCB	pp at 7 and 8 TeV

$\Gamma\big(\Sigma_c(2455)^0 p\overline{p},\ \Sigma_c^0\to\Lambda_c^+\pi^-\big)/\Gamma\big(\Lambda_c^+ p\overline{p}\pi^-\big)$ Γ_{42}/Γ_{41}

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
8.9±1.5±0.6	AAIJ	18AW	LHCB	pp at 7 and 8 TeV

$\Gamma\big(\Sigma_c(2520)^0 p\overline{p}, \Sigma_c(2520)^0\to\Lambda_c^+\pi^-\big)/\Gamma\big(\Lambda_c^+ p\overline{p}\pi^-\big)$ Γ_{43}/Γ_{41}

VALUE	DOCUMENT ID		TECN	COMMENT
0.119±0.020±0.014	AAIJ	18AW	LHCB	pp at 7 and 8 TeV

$\Gamma\big(\Lambda K^0 2\pi^+ 2\pi^-\big)/\Gamma_{\rm total}$ Γ_{44}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
seen	4	[1] ARENTON	86	FMPS	$\Lambda K_S^0 2\pi^+ 2\pi^-$

[1] See the footnote to the ARENTON 86 mass value.

$\Gamma\big(\Lambda_c^+\ell^-\overline{\nu}_\ell\,\text{anything}\big)/\Gamma_{\rm total}$ Γ_{45}/Γ

The values and averages in this section serve only to show what values result if one assumes our B($b \to b$-baryon). They cannot be thought of as measurements since the underlying product branching fractions were also used to determine B($b \to b$-baryon) as described in the note on "Production and Decay of b-Flavored Hadrons."

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.109±0.022 OUR AVERAGE					
0.102±0.019±0.013		[1] BARATE	98D	ALEP	$e^+e^-\to Z$
$0.14\ ^{+0.05}_{-0.04}\ \pm0.02$	29	[2] ABREU	95S	DLPH	$e^+e^-\to Z$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.090±0.022±0.012	55	[3] BUSKULIC	95L	ALEP	Repl. by BARATE 98D
0.18 ±0.07 ±0.02	21	[4] BUSKULIC	92E	ALEP	$\Lambda_c^+\to pK^-\pi^+$

[1] BARATE 98D reports $[\Gamma(\Lambda_b^0 \to \Lambda_c^+\ell^-\overline{\nu}_\ell\,\text{anything})/\Gamma_{\rm total}] \times [B(\overline{b}\to b\text{-baryon})] = 0.0086 \pm 0.0007 \pm 0.0014$ which we divide by our best value $B(\overline{b}\to b\text{-baryon}) = (8.4 \pm 1.1)\times10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Measured using $\Lambda_c\ell^-$ and $\Lambda\ell^+\ell^-$.

[2] ABREU 95S reports $[\Gamma(\Lambda_b^0 \to \Lambda_c^+\ell^-\overline{\nu}_\ell\,\text{anything})/\Gamma_{\rm total}] \times [B(\overline{b}\to b\text{-baryon})] = 0.0118 \pm 0.0026^{+0.0031}_{-0.0021}$ which we divide by our best value $B(\overline{b}\to b\text{-baryon}) = (8.4 \pm$

1.1) $\times$ 10^{-2}. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[3] BUSKULIC 95L reports $[\Gamma(\Lambda_b^0 \to \Lambda_c^+ \ell^- \overline{\nu}_\ell \text{anything})/\Gamma_{\text{total}}] \times [B(\overline{b} \to b\text{-baryon})] = 0.00755 \pm 0.0014 \pm 0.0012$ which we divide by our best value $B(\overline{b} \to b\text{-baryon}) = (8.4 \pm 1.1) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[4] BUSKULIC 92E reports $[\Gamma(\Lambda_b^0 \to \Lambda_c^+ \ell^- \overline{\nu}_\ell \text{anything})/\Gamma_{\text{total}}] \times [B(\overline{b} \to b\text{-baryon})] = 0.015 \pm 0.0035 \pm 0.0045$ which we divide by our best value $B(\overline{b} \to b\text{-baryon}) = (8.4 \pm 1.1) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Superseded by BUSKULIC 95L.

$\Gamma(\Lambda_c^+ \ell^- \overline{\nu}_\ell)/\Gamma_{\text{total}}$ — Γ_{46}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
$\mathbf{0.062^{+0.014}_{-0.013}}$ **OUR FIT**				
$\mathbf{0.050^{+0.011}_{-0.008}{}^{+0.016}_{-0.012}}$	[1] ABDALLAH	04A	DLPH	$e^+ e^- \to Z^0$

[1] Derived from a combined likelihood and event rate fit to the distribution of the Isgur-Wise variable and using HQET. The slope of the form factor is measured to be $\rho^2 = 2.03 \pm 0.46^{+0.72}_{-1.00}$.

$\Gamma(\Lambda_c^+ \ell^- \overline{\nu}_\ell)/\Gamma(\Lambda_c^+ \pi^-)$ — Γ_{46}/Γ_{30}

VALUE	DOCUMENT ID		TECN	COMMENT
$\mathbf{12.8^{+3.0}_{-2.7}}$ **OUR FIT**				
$\mathbf{16.6 \pm 3.0^{+2.8}_{-3.6}}$	AALTONEN	09E	CDF	$p\overline{p}$ at 1.96 TeV

$\Gamma(\Lambda_c^+ \pi^+ \pi^- \ell^- \overline{\nu}_\ell)/\Gamma_{\text{total}}$ — Γ_{47}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
$\mathbf{0.056^{+0.031}_{-0.030}}$	[1] ABDALLAH	04A	DLPH	$e^+ e^- \to Z^0$

[1] Derived from the fraction of $\Gamma(\Lambda_b^0 \to \Lambda_c^+ \ell^- \overline{\nu}_\ell)$ / ($\Gamma(\Lambda_b^0 \to \Lambda_c^+ \ell^- \overline{\nu}_\ell) + \Gamma(\Lambda_b^0 \to \Lambda_c^+ \pi^+ \pi^- \ell^- \overline{\nu}_\ell)$) $= 0.47^{+0.10}_{-0.08}{}^{+0.07}_{-0.06}$.

$\Gamma(\Lambda_c^+ \ell^- \overline{\nu}_\ell)/[\Gamma(\Lambda_c^+ \ell^- \overline{\nu}_\ell) + \Gamma(\Lambda_c^+ \pi^+ \pi^- \ell^- \overline{\nu}_\ell)]$ — $\Gamma_{46}/(\Gamma_{46}+\Gamma_{47})$

VALUE	DOCUMENT ID		TECN	COMMENT
$\mathbf{0.47^{+0.10}_{-0.08}{}^{+0.07}_{-0.06}}$	ABDALLAH	04A	DLPH	$e^+ e^- \to Z^0$

$\Gamma(\Lambda_c(2595)^+ \ell^- \overline{\nu}_\ell)/\Gamma(\Lambda_c^+ \ell^- \overline{\nu}_\ell)$ — Γ_{48}/Γ_{46}

VALUE	DOCUMENT ID		TECN	COMMENT
$\mathbf{0.126 \pm 0.033^{+0.047}_{-0.038}}$	[1] AALTONEN	09E	CDF	$p\overline{p}$ at 1.96 TeV

[1] AALTONEN 09E assumes isospin conservation for $\Lambda_c(2595) \to \Lambda_c \pi^+ \pi^+$ and $\Lambda_c(2595) \to \Lambda_c \pi^0 \pi^0$. Significant isospin violation from thresholds in $\Lambda_c(2595) \to \Sigma_c(2455)\pi \to \Lambda_c \pi\pi$ may alter the recovered ratio.

$\Gamma(\Lambda_c(2625)^+ \ell^- \overline{\nu}_\ell)/\Gamma(\Lambda_c^+ \ell^- \overline{\nu}_\ell)$ — Γ_{49}/Γ_{46}

VALUE	DOCUMENT ID		TECN	COMMENT
$0.210 \pm 0.042^{+0.071}_{-0.050}$	AALTONEN	09E	CDF	$p\overline{p}$ at 1.96 TeV

$\left[\frac{1}{2}\Gamma(\Sigma_c(2455)^0 \pi^+ \ell^- \overline{\nu}_\ell) + \frac{1}{2}\Gamma(\Sigma_c(2455)^{++} \pi^- \ell^- \overline{\nu}_\ell)\right]/\Gamma(\Lambda_c^+ \ell^- \overline{\nu}_\ell)$ — $(\frac{1}{2}\Gamma_{50}+\frac{1}{2}\Gamma_{51})/\Gamma_{46}$

VALUE	DOCUMENT ID		TECN	COMMENT
$0.054 \pm 0.022^{+0.021}_{-0.018}$	AALTONEN	09E	CDF	$p\overline{p}$ at 1.96 TeV

$\Gamma(p h^-)/\Gamma_{\text{total}}$ — Γ_{52}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<2.3 \times 10^{-5}$	90	[1] ACOSTA	05O	CDF	$p\overline{p}$ at 1.96 TeV

[1] Assumes f_Λ / f_d = 0.25, and equal momentum distribution for Λ_b and B mesons.

$\Gamma(p\pi^-)/\Gamma_{\text{total}}$ — Γ_{53}/Γ

VALUE (units 10^{-6})	CL%	DOCUMENT ID		TECN	COMMENT
4.5±0.8 OUR FIT					
4.0±0.9±0.5		[1] AALTONEN	09C	CDF	$p\overline{p}$ at 1.96 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<50	90	[2] BUSKULIC	96V	ALEP	$e^+ e^- \to Z$

[1] AALTONEN 09C reports $[\Gamma(\Lambda_b^0 \to p\pi^-)/\Gamma_{\text{total}}]$ / $[B(B^0 \to K^+\pi^-)]$ × $[B(\overline{b} \to b\text{-baryon})]$ / $[B(\overline{b} \to B^0)]$ = 0.042 ± 0.007 ± 0.006 which we multiply or divide by our best values $B(B^0 \to K^+\pi^-) = (1.96 \pm 0.05) \times 10^{-5}$, $B(\overline{b} \to b\text{-baryon}) = (8.4 \pm 1.1) \times 10^{-2}$, $B(\overline{b} \to B^0) = (40.8 \pm 0.7) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best values.

[2] BUSKULIC 96V assumes PDG 96 production fractions for B^0, B^+, B_s, b baryons.

$\Gamma(pK^-)/\Gamma_{\text{total}}$ — Γ_{54}/Γ

VALUE (units 10^{-6})	CL%	DOCUMENT ID		TECN	COMMENT
5.4±1.0 OUR FIT					
6.3±1.1±0.8		[1] AALTONEN	09C	CDF	$p\overline{p}$ at 1.96 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<360	90	[2] ADAM	96D	DLPH	$e^+ e^- \to Z$
< 50	90	[3] BUSKULIC	96V	ALEP	$e^+ e^- \to Z$

[1] AALTONEN 09C reports $[\Gamma(\Lambda_b^0 \to pK^-)/\Gamma_{\text{total}}]$ / $[B(B^0 \to K^+\pi^-)]$ × $[B(\overline{b} \to b\text{-baryon})]$ / $[B(\overline{b} \to B^0)]$ = 0.066 ± 0.009 ± 0.008 which we multiply or divide by our best values $B(B^0 \to K^+\pi^-) = (1.96 \pm 0.05) \times 10^{-5}$, $B(\overline{b} \to b\text{-baryon}) = (8.4 \pm 1.1) \times 10^{-2}$, $B(\overline{b} \to B^0) = (40.8 \pm 0.7) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best values.

[2] ADAM 96D assumes $f_{B^0} = f_{B^-} = 0.39$ and $f_{B_s} = 0.12$.

[3] BUSKULIC 96V assumes PDG 96 production fractions for B^0, B^+, B_s, b baryons.

$\Gamma(p\pi^-)/\Gamma(pK^-)$ — Γ_{53}/Γ_{54}

VALUE	DOCUMENT ID		TECN	COMMENT
0.84±0.09 OUR FIT				
0.86±0.08±0.05	AAIJ	12AR	LHCB	pp at 7 TeV

$\Gamma(pD_s^-)/\Gamma_{total}$ Γ_{55}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<4.8\times10^{-4}$	90	AAIJ	14Q	LHCB	pp at 7 TeV

$\Gamma(p\mu^-\overline{\nu}_\mu)/\Gamma_{total}$ Γ_{56}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
4.1±1.0	[1] AAIJ	15BG	LHCB	pp at 8 TeV

[1] The ratio of B($\Lambda_b^0 \to p\mu^-\overline{\nu}_\mu$) to B($\Lambda_b^0 \to \Lambda_c^+\mu^-\overline{\nu}_\mu$) is measured within a restricted q^2 region. Combined with theoretical calculations of the form factors and the previously measured value of $|V_{cb}|$, the first $|V_{ub}| = (3.27 \pm 0.15 \pm 0.16 \pm 0.06) \times 10^{-3}$ measurement from the Λ_b decay is obtained, consistent with the exclusively measured world averages.

$\Gamma(p\mu^-\overline{\nu}_\mu)/\Gamma(\Lambda_c^+\ell^-\overline{\nu}_\ell)$ Γ_{56}/Γ_{46}

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1.0±0.04±0.08	[1] AAIJ	15BG	LHCB	pp at 8 TeV

[1] This measurement is a ratio of $\Gamma(\Lambda_b^0 \to p\mu^-\overline{\nu}_\mu)$[q^2 $>$ 15 GeV/c^2] to $\Gamma(\Lambda_b^0 \to \Lambda_c^+\mu^-\overline{\nu}_\mu)$[q^2 $>$ 7 GeV/c^2] within a restricted q^2 region. Combined with theoretical calculations of the form factors and the previously measured value of $|V_{cb}|$, the first $|V_{ub}|$ = $(3.27 \pm 0.15 \pm 0.16 \pm 0.06) \times 10^{-3}$ measurement from the Λ_b decay is obtained, consistent with the exclusively measured world averages.

$\Gamma(\Lambda\mu^+\mu^-)/\Gamma_{total}$ Γ_{57}/Γ

VALUE (units 10^{-7})	DOCUMENT ID		TECN	COMMENT
10.8±2.8 OUR AVERAGE				
9.6±1.6±2.5	[1] AAIJ	13AJ	LHCB	pp at 7 TeV
17.3±4.2±5.5	AALTONEN	11AI	CDF	$p\overline{p}$ at 1.96 TeV

[1] Uses B($\Lambda_b^0 \to J/\psi\Lambda$) = $(6.2 \pm 1.4) \times 10^{-4}$. This measurement comes from the sum of the differential rates in q^2 regions excluding those corresponding to J/ψ and $\psi(2S)$ ([8.68,10.09] and [12.86, 14.18] GeV^2/c^4).

$\Gamma(p\pi^-\mu^+\mu^-)/\Gamma_{total}$ Γ_{58}/Γ

VALUE (units 10^{-8})	DOCUMENT ID		TECN	COMMENT
$6.9\pm1.9^{+1.7}_{-1.5}$	[1] AAIJ	17P	LHCB	pp at 7, 8 TeV

[1] Excludes J/ψ and $\psi(2S)$ decays to $\mu^+\mu^-$.

$\Gamma(p\pi^-\mu^+\mu^-)/\Gamma(p\pi^-J/\psi,\ J/\psi\to\mu^+\mu^-)$ Γ_{58}/Γ_{13}

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
4.4±1.2±0.7	[1] AAIJ	17P	LHCB	pp at 7, 8 TeV

[1] The $p\pi^-\mu^+\mu^-$ mode excludes J/ψ and $\psi(2S)$ decays to $\mu^+\mu^-$.

$\Gamma(pK^- e^+ e^-)/\Gamma_{total}$ — Γ_{59}/Γ

VALUE (units 10^{-6})	DOCUMENT ID		TECN	COMMENT
$\mathbf{0.310 \pm 0.040 ^{+0.054}_{-0.047}}$	[1,2] AAIJ	20M	LHCB	pp at 7, 8, 13 TeV

[1] Measured over $0.1 < q^2 < 6.0$ GeV/c^2, and $m_{pK} < 2.6$ GeV/c^2.
[2] The first uncertainty is the statistical uncertainty and the second is the combination of all systematic uncertainties including those related to the normalization of $\Lambda_b^0 \to J/\psi p K^-$.

$\Gamma(pK^- \mu^+ \mu^-)/\Gamma_{total}$ — Γ_{60}/Γ

VALUE (units 10^{-6})	DOCUMENT ID		TECN	COMMENT
$\mathbf{0.265 \pm 0.014 ^{+0.049}_{-0.039}}$	[1,2] AAIJ	20M	LHCB	pp at 7, 8, 13 TeV

[1] Measured over $0.1 < q^2 < 6.0$ GeV/c^2, and $m_{pK} < 2.6$ GeV/c^2.
[2] The first uncertainty is the statistical uncertainty and the second is the combination of all systematic uncertainties including those related to the normalization of $\Lambda_b^0 \to J/\psi p K^-$.

$\Gamma(pK^- \mu^+ \mu^-)/\Gamma(pK^- e^+ e^-)$ — Γ_{60}/Γ_{59}

VALUE	DOCUMENT ID		TECN	COMMENT
$\mathbf{0.86 ^{+0.14}_{-0.11} \pm 0.05}$	[1] AAIJ	20M	LHCB	pp at 7, 8, 13 TeV

[1] Measured over $0.1 < q^2 < 6.0$ GeV/c^2, and $m_{pK} < 2.6$ GeV/c^2.

$\Gamma(pK^- e^+ e^-)/\Gamma(pJ/\psi K^-)$ — Γ_{59}/Γ_{14}

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
$\mathbf{9.8 ^{+1.4}_{-1.3} \pm 0.8}$	[1] AAIJ	20M	LHCB	pp at 7, 8, 13 TeV

[1] Measured over $0.1 < q^2 < 6.0$ GeV/c^2, and $m_{pK} < 2.6$ GeV/c^2.

$\Gamma(pK^- \mu^+ \mu^-)/\Gamma(pJ/\psi K^-)$ — Γ_{60}/Γ_{14}

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
8.4±0.4±0.4	[1] AAIJ	20M	LHCB	pp at 7, 8, 13 TeV

[1] Measured over $0.1 < q^2 < 6.0$ GeV/c^2, and $m_{pK} < 2.6$ GeV/c^2.

$\Gamma(\Lambda\gamma)/\Gamma_{total}$ — Γ_{61}/Γ

VALUE (units 10^{-6})	CL%	DOCUMENT ID		TECN	COMMENT
7.1±1.5±0.9		[1] AAIJ	19Z	LHCB	pp at 13 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<1300	90	ACOSTA	02G	CDF	$p\overline{p}$ at 1.8 TeV

[1] AAIJ 19Z normalized to $B^0 \to K^{*0}\gamma$ and used an integrated luminosity of 1.7 fb^{-1}.

$\Gamma(\Lambda\eta)/\Gamma_{total}$ — Γ_{62}/Γ

VALUE (units 10^{-6})	DOCUMENT ID		TECN	COMMENT
$\mathbf{9 ^{+7}_{-5} \pm 1}$	[1] AAIJ	15AH	LHCB	pp at 7, 8 TeV

[1] AAIJ 15AH reports $[\Gamma(\Lambda_b^0 \to \Lambda\eta)/\Gamma_{\text{total}}]$ / $[B(B^0 \to \eta' K^0)] = 0.142^{+0.11}_{-0.08}$ which we multiply by our best value $B(B^0 \to \eta' K^0) = (6.6 \pm 0.4) \times 10^{-5}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. The single uncertainty quoted with the original measurement combines in quadrature statistical and systematic uncertainties.

$\Gamma(\Lambda\eta'(958))/\Gamma_{\text{total}}$ — Γ_{63}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<3.1 \times 10^{-6}$	90	[1] AAIJ 15AH	LHCB	pp at 7, 8 TeV

[1] AAIJ 15AH reports $[\Gamma(\Lambda_b^0 \to \Lambda\eta'(958))/\Gamma_{\text{total}}]$ / $[B(B^0 \to \eta' K^0)] < 0.047$ which we multiply by our best value $B(B^0 \to \eta' K^0) = 6.6 \times 10^{-5}$.

$\Gamma(\Lambda\pi^+\pi^-)/\Gamma(\Lambda_c^+\pi^-)$ — Γ_{64}/Γ_{30}

VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT
9.5±3.8±0.5	[1] AAIJ 16W	LHCB	pp at 7, 8 TeV

[1] AAIJ 16W reports $[\Gamma(\Lambda_b^0 \to \Lambda\pi^+\pi^-)/\Gamma(\Lambda_b^0 \to \Lambda_c^+\pi^-)]$ / $[B(\Lambda_c^+ \to \Lambda\pi^+)] = (7.3 \pm 1.9 \pm 2.2) \times 10^{-2}$ which we multiply by our best value $B(\Lambda_c^+ \to \Lambda\pi^+) = (1.30 \pm 0.07) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\Lambda K^+\pi^-)/\Gamma(\Lambda_c^+\pi^-)$ — Γ_{65}/Γ_{30}

VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT
11.6±2.3±0.6	[1] AAIJ 16W	LHCB	pp at 7, 8 TeV

[1] AAIJ 16W reports $[\Gamma(\Lambda_b^0 \to \Lambda K^+\pi^-)/\Gamma(\Lambda_b^0 \to \Lambda_c^+\pi^-)]$ / $[B(\Lambda_c^+ \to \Lambda\pi^+)] = (8.9 \pm 1.2 \pm 1.3) \times 10^{-2}$ which we multiply by our best value $B(\Lambda_c^+ \to \Lambda\pi^+) = (1.30 \pm 0.07) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\Lambda K^+K^-)/\Gamma(\Lambda_c^+\pi^-)$ — Γ_{66}/Γ_{30}

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
3.29±0.35±0.17	[1] AAIJ 16W	LHCB	pp at 7, 8 TeV

[1] AAIJ 16W reports $[\Gamma(\Lambda_b^0 \to \Lambda K^+K^-)/\Gamma(\Lambda_b^0 \to \Lambda_c^+\pi^-)]$ / $[B(\Lambda_c^+ \to \Lambda\pi^+)] = (25.3 \pm 1.9 \pm 1.9) \times 10^{-2}$ which we multiply by our best value $B(\Lambda_c^+ \to \Lambda\pi^+) = (1.30 \pm 0.07) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\Lambda\phi)/\Gamma_{\text{total}}$ — Γ_{67}/Γ

VALUE (units 10^{-6})	DOCUMENT ID	TECN	COMMENT
$9.8 \pm 2.1^{+1.6}_{-1.5}$	[1] AAIJ 16J	LHCB	pp at 7, 8 TeV

[1] AAIJ 16J reports $[\Gamma(\Lambda_b^0 \to \Lambda\phi)/\Gamma_{\text{total}}]$ / $[B(B^0 \to K^0\phi)] \times [B(\overline{b} \to b\text{-baryon})]$ / $[B(\overline{b} \to B^0)] = 0.275 \pm 0.055 \pm 0.020$ which we multiply or divide by our best values $B(B^0 \to K^0\phi) = (7.3 \pm 0.7) \times 10^{-6}$, $B(\overline{b} \to b\text{-baryon}) = (8.4 \pm 1.1) \times 10^{-2}$, $B(\overline{b} \to B^0) = (40.8 \pm 0.7) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best values.

$\Gamma(p\pi^-\pi^+\pi^-)/\Gamma(\Lambda_c^+\pi^-)$ Γ_{68}/Γ_{30}

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
$4.30\pm0.24^{+0.22}_{-0.23}$	[1] AAIJ	18Q	LHCB	pp at 7, 8 TeV

[1] AAIJ 18Q reports $[\Gamma(\Lambda_b^0 \to p\pi^-\pi^+\pi^-)/\Gamma(\Lambda_b^0 \to \Lambda_c^+\pi^-)]$ / $[B(\Lambda_c^+ \to pK^-\pi^+)]$ = $(6.85 \pm 0.19 \pm 0.08 \pm 0.32) \times 10^{-2}$ which we multiply by our best value $B(\Lambda_c^+ \to pK^-\pi^+) = (6.28 \pm 0.32) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(pK^-K^+\pi^-)/\Gamma(\Lambda_c^+\pi^-)$ Γ_{69}/Γ_{30}

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
$0.83\pm0.10\pm0.04$	[1] AAIJ	18Q	LHCB	pp at 7, 8 TeV

[1] AAIJ 18Q reports $[\Gamma(\Lambda_b^0 \to pK^-K^+\pi^-)/\Gamma(\Lambda_b^0 \to \Lambda_c^+\pi^-)]$ / $[B(\Lambda_c^+ \to pK^-\pi^+)]$ = $(1.32 \pm 0.09 \pm 0.09 \pm 0.10) \times 10^{-2}$ which we multiply by our best value $B(\Lambda_c^+ \to pK^-\pi^+) = (6.28 \pm 0.32) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(pK^-\pi^+\pi^-)/\Gamma(\Lambda_c^+\pi^-)$ Γ_{70}/Γ_{30}

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
$10.3\pm0.5\pm0.5$	[1] AAIJ	18Q	LHCB	pp at 7, 8 TeV

[1] AAIJ 18Q reports $[\Gamma(\Lambda_b^0 \to pK^-\pi^+\pi^-)/\Gamma(\Lambda_b^0 \to \Lambda_c^+\pi^-)]$ / $[B(\Lambda_c^+ \to pK^-\pi^+)]$ = $(16.4 \pm 0.3 \pm 0.2 \pm 0.7) \times 10^{-2}$ which we multiply by our best value $B(\Lambda_c^+ \to pK^-\pi^+) = (6.28 \pm 0.32) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(pK^-K^+K^-)/\Gamma(\Lambda_c^+\pi^-)$ Γ_{71}/Γ_{30}

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
$2.58\pm0.15^{+0.13}_{-0.14}$	[1] AAIJ	18Q	LHCB	pp at 7, 8 TeV

[1] AAIJ 18Q reports $[\Gamma(\Lambda_b^0 \to pK^-K^+K^-)/\Gamma(\Lambda_b^0 \to \Lambda_c^+\pi^-)]$ / $[B(\Lambda_c^+ \to pK^-\pi^+)]$ = $(4.11 \pm 0.12 \pm 0.06 \pm 0.19) \times 10^{-2}$ which we multiply by our best value $B(\Lambda_c^+ \to pK^-\pi^+) = (6.28 \pm 0.32) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

PARTIAL BRANCHING FRACTIONS IN $\Lambda_b \to \Lambda\mu^+\mu^-$

$B(\Lambda_b \to \Lambda\mu^+\mu^-)$ ($q^2 < 2.0$ GeV^2/c^4)

VALUE (units 10^{-7})	DOCUMENT ID		TECN	COMMENT
0.71 ± 0.27 OUR AVERAGE				
$0.72^{+0.24}_{-0.22}\pm0.14$	[1] AAIJ	15AE	LHCB	pp at 7, 8 TeV
$0.15\pm2.01\pm0.05$	AALTONEN	11AI	CDF	$p\overline{p}$ at 1.96 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.56\pm0.76\pm0.80$	[2] AAIJ	13AJ	LHCB	Repl. by AAIJ 15AE

[1] AAIJ 15AE measurement covers $0.1 < q^2 < 2.0$ GeV^2/c^4.

[2] Uses $B(\Lambda_b^0 \to J/\psi\Lambda) = (6.2 \pm 1.4) \times 10^{-4}$.

$B(\Lambda_b \to \Lambda\mu^+\mu^-)$ ($2.0 < q^2 < 4.3$ GeV^2/c^4)

VALUE (units 10^{-7})	DOCUMENT ID		TECN	COMMENT
$0.28^{+0.28}_{-0.21}$ OUR AVERAGE				
$0.253^{+0.276}_{-0.207}\pm0.046$	[1] AAIJ	15AE	LHCB	pp at 7, 8 TeV
$1.8 \pm1.7 \pm0.6$	AALTONEN	11AI	CDF	$p\overline{p}$ at 1.96 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.71 \pm0.60 \pm0.23$	[2] AAIJ	13AJ	LHCB	Repl. by AAIJ 15AE

[1] AAIJ 15AE measurement covers $2.0 < q^2 < 4.0$ GeV^2/c^4.
[2] Uses $B(\Lambda_b^0 \to J/\psi\Lambda) = (6.2 \pm 1.4) \times 10^{-4}$.

$B(\Lambda_b \to \Lambda\mu^+\mu^-)$ ($q^2 < 4.3$ GeV^2/c^4)

VALUE (units 10^{-7})	DOCUMENT ID		TECN	COMMENT
$2.7\pm2.5\pm0.9$	AALTONEN	11AI	CDF	$p\overline{p}$ at 1.96 TeV

$B(\Lambda_b \to \Lambda\mu^+\mu^-)$ ($4.0 < q^2 < 6.0$ GeV^2/c^4)

VALUE (units 10^{-7})	DOCUMENT ID		TECN	COMMENT
$0.04^{+0.18}_{-0.00}\pm0.02$	AAIJ	15AE	LHCB	pp at 7, 8 TeV

$B(\Lambda_b \to \Lambda\mu^+\mu^-)$ ($1.0 < q^2 < 6.0$ GeV^2/c^4)

VALUE (units 10^{-7})	DOCUMENT ID		TECN	COMMENT
$0.47^{+0.31}_{-0.27}$ OUR AVERAGE				
$0.45^{+0.30}_{-0.25}\pm0.10$	[1] AAIJ	15AE	LHCB	pp at 7 and 8 TeV
$1.3 \pm2.1 \pm0.4$	AALTONEN	11AI	CDF	$p\overline{p}$ at 1.96 TeV

[1] AAIJ 15AE measurement covers $1.1 < q^2 < 6.0$ GeV^2/c^4.

$B(\Lambda_b \to \Lambda\mu^+\mu^-)$ ($6.0 < q^2 < 8.0$ GeV^2/c^4)

VALUE (units 10^{-7})	DOCUMENT ID		TECN	COMMENT
$0.50^{+0.24}_{-0.22}\pm0.10$	AAIJ	15AE	LHCB	pp at 7, 8 TeV

$B(\Lambda_b \to \Lambda\mu^+\mu^-)$ ($4.3 < q^2 < 8.68$ GeV^2/c^4)

VALUE (units 10^{-7})	DOCUMENT ID		TECN	COMMENT
0.5 ± 0.7 OUR AVERAGE				
$0.66\pm0.74\pm0.18$	[1] AAIJ	13AJ	LHCB	pp at 7 TeV
$-0.2 \pm1.6 \pm0.1$	AALTONEN	11AI	CDF	$p\overline{p}$ at 1.96 TeV

[1] Uses $B(\Lambda_b^0 \to J/\psi\Lambda) = (6.2 \pm 1.4) \times 10^{-4}$.

$B(\Lambda_b \to \Lambda\mu^+\mu^-)$ ($10.09 < q^2 < 12.86$ GeV^2/c^4)

VALUE (units 10^{-7})	DOCUMENT ID		TECN	COMMENT
2.2 ± 0.6 OUR AVERAGE				
$2.08^{+0.42}_{-0.39}\pm0.42$	[1] AAIJ	15AE	LHCB	pp at 7, 8 TeV
$3.0 \pm1.5 \pm1.0$	AALTONEN	11AI	CDF	$p\overline{p}$ at 1.96 TeV

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

$1.55 \pm 0.58 \pm 0.55$	[2] AAIJ	13AJ	LHCB	Repl. by AAIJ 15AE

[1] AAIJ 15AE measurement covers $11.0 < q^2 < 12.5$ GeV^2/c^4.
[2] Uses B($\Lambda_b^0 \to J/\psi\Lambda$) = $(6.2 \pm 1.4) \times 10^{-4}$.

B($\Lambda_b \to \Lambda\mu^+\mu^-$) (14.18 < q^2 < 16.0 GeV^2/c^4)

VALUE (units 10^{-7})	DOCUMENT ID		TECN	COMMENT
1.7 ±0.5 OUR AVERAGE	Error includes scale factor of 1.1.			
$2.04^{+0.35}_{-0.33} \pm 0.42$	[1] AAIJ	15AE	LHCB	pp at 7, 8 TeV
$1.0 \pm 0.7 \pm 0.3$	AALTONEN	11AI	CDF	$p\overline{p}$ at 1.96 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$1.44 \pm 0.44 \pm 0.42$	[2] AAIJ	13AJ	LHCB	Repl. by AAIJ 15AE

[1] AAIJ 15AE measurement covers $15.0 < q^2 < 16.0$ GeV^2/c^4.
[2] Uses B($\Lambda_b^0 \to J/\psi\Lambda$) = $(6.2 \pm 1.4) \times 10^{-4}$.

B($\Lambda_b \to \Lambda\mu^+\mu^-$) (16.0 < q^2 GeV^2/c^4)

VALUE (units 10^{-7})	DOCUMENT ID		TECN	COMMENT
7.0 ±1.9 ±2.2	AALTONEN	11AI	CDF	$p\overline{p}$ at 1.96 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$4.73 \pm 0.77 \pm 1.25$	[1,2] AAIJ	13AJ	LHCB	Repl. by AAIJ 15AE

[1] Uses B($\Lambda_b^0 \to J/\psi\Lambda$) = $(6.2 \pm 1.4) \times 10^{-4}$.
[2] Requires $16.00 < q^2 < 20.30$ GeV^2/c^4.

B($\Lambda_b \to \Lambda\mu^+\mu^-$) (18.0 < q^2 < 20.0 GeV^2/c^4)

VALUE (units 10^{-7})	DOCUMENT ID		TECN	COMMENT
2.44±0.28±0.50	AAIJ	15AE	LHCB	pp at 7, 8 TeV

B($\Lambda_b \to \Lambda\mu^+\mu^-$) (15.0 < q^2 < 20.0 GeV^2/c^4)

VALUE (units 10^{-7})	DOCUMENT ID		TECN	COMMENT
6.00±0.45±1.25	AAIJ	15AE	LHCB	pp at 7, 8 TeV

CP VIOLATION

A_{CP} is defined as

$$A_{CP} = \frac{B(\Lambda_b^0 \to f) - B(\overline{\Lambda}_b^0 \to \overline{f})}{B(\Lambda_b^0 \to f) + B(\overline{\Lambda}_b^0 \to \overline{f})},$$

the *CP*-violation asymmetry of exclusive Λ_b^0 and $\overline{\Lambda}_b^0$ decay.

$A_{CP}(\Lambda_b \to p\pi^-)$

VALUE	DOCUMENT ID		TECN	COMMENT
−0.025±0.029 OUR AVERAGE	Error includes scale factor of 1.2.			
$-0.035 \pm 0.017 \pm 0.020$	AAIJ	18AX	LHCB	pp at 7 and 8 TeV
$0.06 \pm 0.07 \pm 0.03$	AALTONEN	14P	CDF	$p\overline{p}$ at 1.96 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.03 \pm 0.17 \pm 0.05$	AALTONEN	11N	CDF	Repl. by AALTONEN 14P

$A_{CP}(\Lambda_b \rightarrow pK^-)$

VALUE	DOCUMENT ID		TECN	COMMENT
−0.025±0.022 OUR AVERAGE				
−0.020±0.013±0.019	AAIJ	18AX	LHCB	pp at 7 and 8 TeV
−0.10 ±0.08 ±0.04	AALTONEN	14P	CDF	$p\overline{p}$ at 1.96 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.37 ±0.17 ±0.03	AALTONEN	11N	CDF	Repl. by AALTONEN 14P

$A_{CP}(\Lambda_b \rightarrow DpK^-)$

VALUE	DOCUMENT ID		TECN	COMMENT
$\mathbf{0.12 \pm 0.09^{+0.02}_{-0.03}}$	[1] AAIJ	21AD	LHCB	pp at 7, 8, 13 TeV

[1] A_{CP} is measured from $(B(\Lambda_b^0 \rightarrow [K^+\pi^-]_D pK^-) - B(\overline{\Lambda}_b^0 \rightarrow [K^-\pi^+]_D \overline{p}K^+))/(B(\Lambda_b^0 \rightarrow [K^+\pi^-]_D pK^-) + B(\overline{\Lambda}_b^0 \rightarrow [K^-\pi^+]_D \overline{p}K^+))$ in the full phase space.

$\Delta A_{CP}(pK^-/\pi^-)$

$\Delta A_{CP} \equiv A_{CP}(pK^-) - A_{CP}(p\pi^-)$

VALUE	DOCUMENT ID		TECN	COMMENT
0.014±0.022±0.010	AAIJ	18AX	LHCB	pp at 7 and 8 TeV

$A_{CP}(\Lambda_b \rightarrow p\overline{K}^0\pi^-)$

VALUE	DOCUMENT ID		TECN	COMMENT
0.22±0.13±0.03	AAIJ	14Q	LHCB	pp at 7 TeV

$\Delta A_{CP}(J/\psi p\pi^-/K^-)$

$\Delta A_{CP} \equiv A_{CP}(J/\psi p\pi^-) - A_{CP}(J/\psi pK^-)$

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
5.7±2.4±1.2	AAIJ	14K	LHCB	pp at 7, 8 TeV

$A_{CP}(\Lambda_b \rightarrow \Lambda K^+\pi^-)$

VALUE	DOCUMENT ID		TECN	COMMENT
−0.53±0.23±0.11	[1] AAIJ	16W	LHCB	pp at 7, 8 TeV

[1] Measured relative to $\Lambda_b^0 \rightarrow \Lambda_c^+\pi^-$ decay.

$A_{CP}(\Lambda_b \rightarrow \Lambda K^+K^-)$

VALUE	DOCUMENT ID		TECN	COMMENT
−0.28±0.10±0.07	[1] AAIJ	16W	LHCB	pp at 7, 8 TeV

[1] Measured relative to $\Lambda_b^0 \rightarrow \Lambda_c^+\pi^-$ decay.

$\Delta A_{CP}(\Lambda_b^0 \rightarrow pK^-\mu^+\mu^-)$

$\Delta A_{CP} \equiv A_{CP}(pK^-\mu^+\mu^-) - A_{CP}(pK^-J/\psi)$

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
−3.5±5.0±0.2	AAIJ	17T	LHCB	pp at 7, 8 TeV

$\Delta A_{CP}(\Lambda_b^0 \to p\pi^-\pi^+\pi^-)$

$\Delta A_{CP} \equiv A_{CP}(\Lambda_b^0 \to p\pi^-\pi^+\pi^-) - A_{CP}(\Lambda_b^0 \to (\Lambda_c^+ \to p\pi^-\pi^+)\pi^-)$

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
1.1±2.5±0.6	[1] AAIJ	19AH	LHCB	pp at 7 and 8 TeV

[1] Full phase space.

$\Delta A_{CP}(\Lambda_b^0 \to (p\pi^-\pi^+\pi^-)_{LBM})$

$\Delta A_{CP} \equiv A_{CP}(\Lambda_b^0 \to (p\pi^-\pi^+\pi^-)_{LBM}) - A_{CP}(\Lambda_b^0 \to (\Lambda_c^+ \to p\pi^-\pi^+)\pi^-)$. Two-body low invariant-mass region (LBM): m($p\pi^-$) < 2000MeV and m($\pi^+\pi^-$) < 1640 MeV.

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
3.7±4.1±0.5	[1] AAIJ	19AH	LHCB	pp at 7 and 8 TeV

[1] Measurement done with $m(p\pi^-) < 2000$ MeV/c^2 and $m(\pi^+\pi^-) < 1640$ MeV/c^2.

$\Delta A_{CP}(\Lambda_b^0 \to p a_1(1260)^-)$

$\Delta A_{CP} \equiv A_{CP}(\Lambda_b^0 \to p a_1(1260)^-) - A_{CP}(\Lambda_b^0 \to (\Lambda_c^+ \to p\pi^-\pi^+)\pi^-)$. 419 < m($\pi^+\pi^-\pi^+$) < 1500 MeV.

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
−1.5±4.2±0.6	AAIJ	19AH	LHCB	pp at 7 and 8 TeV

$\Delta A_{CP}(\Lambda_b^0 \to N(1520)^0 \rho(770)^0)$

$\Delta A_{CP} \equiv A_{CP}(\Lambda_b^0 \to N(1520)^0 \rho(770)^0) - A_{CP}(\Lambda_b^0 \to (\Lambda_c^+ \to p\pi^-\pi^+)\pi^-)$. 1078 < m($p\pi^-$) < 1800 MeV and m($\pi^+\pi^-$) < 1100 MeV.

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
2.0±4.9±0.4	AAIJ	19AH	LHCB	pp at 7 and 8 TeV

$\Delta A_{CP}(\Lambda_b^0 \to \Delta(1232)^{++}\pi^-\pi^-)$

$\Delta A_{CP} \equiv A_{CP}(\Lambda_b^0 \to \Delta(1232)^{++}\pi^-\pi^-) - A_{CP}(\Lambda_b^0 \to (\Lambda_c^+ \to p\pi^-\pi^+)\pi^-)$. 1078 < m($p\pi^+$) < 1432 MeV.

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
0.1±3.2±0.6	AAIJ	19AH	LHCB	pp at 7 and 8 TeV

$\Delta A_{CP}(\Lambda_b^0 \to pK^-\pi^+\pi^-)$

$\Delta A_{CP} \equiv A_{CP}(\Lambda_b^0 \to pK^-\pi^+\pi^-) - A_{CP}(\Lambda_b^0 \to (\Lambda_c^+ \to pK^-\pi^+)\pi^-)$

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
3.2±1.1±0.6	[1] AAIJ	19AH	LHCB	pp at 7 and 8 TeV

[1] Full phase space.

$\Delta A_{CP}(\Lambda_b^0 \to (pK^-\pi^+\pi^-)_{LBM})$

$\Delta A_{CP} \equiv A_{CP}(\Lambda_b^0 \to (pK^-\pi^+\pi^-)_{LBM}) - A_{CP}(\Lambda_b^0 \to (\Lambda_c^+ \to pK^-\pi^+)\pi^-)$. Two-body low invariant-mass region (LBM): m(pK^-) < 2000 MeV and m($\pi^+\pi^-$) < 1640 MeV.

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
3.5±1.5±0.5	[1] AAIJ	19AH	LHCB	pp at 7 and 8 TeV

[1] Measurement done with $m(pK^-) < 2000$ MeV/c^2 and $m(\pi^+\pi^-) < 1640$ MeV/c^2.

$\Delta A_{CP}(\Lambda_b^0 \to N(1520)^0 K^*(892)^0)$

$\Delta A_{CP} \equiv A_{CP}(\Lambda_b^0 \to N(1520)^0 K^*(892)^0) - A_{CP}(\Lambda_b^0 \to (\Lambda_c^+ \to pK^-\pi^+)\pi^-)$. $1078 < m(p\pi^-) < 1800$ MeV and $750 < m(\pi^+K^-) < 1100$ MeV.

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
5.5±2.5±0.5	AAIJ	19AH	LHCB	pp at 7 and 8 TeV

$\Delta A_{CP}(\Lambda_b^0 \to \Lambda(1520)\rho(770)^0)$

$\Delta A_{CP} \equiv A_{CP}(\Lambda_b^0 \to \Lambda(1520)\rho(770)^0) - A_{CP}(\Lambda_b^0 \to (\Lambda_c^+ \to pK^-\pi^+)\pi^-)$. $1460 < m(pK^-) < 1580$ MeV and $m(\pi^+\pi^-) < 1100$ MeV.

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
0.6±6.0±0.5	AAIJ	19AH	LHCB	pp at 7 and 8 TeV

$\Delta A_{CP}(\Lambda_b^0 \to \Delta(1232)^{++} K^-\pi^-)$

$\Delta A_{CP} \equiv A_{CP}(\Lambda_b^0 \to \Delta(1232)^{++} K^-\pi^-) - A_{CP}(\Lambda_b^0 \to (\Lambda_c^+ \to pK^-\pi^+)\pi^-)$. $1078 < m(p\pi^+) < 1432$ MeV.

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
4.4±2.6±0.6	AAIJ	19AH	LHCB	pp at 7 and 8 TeV

$\Delta A_{CP}(\Lambda_b^0 \to pK_1(1410)^-)$

$\Delta A_{CP} \equiv A_{CP}(\Lambda_b^0 \to pK_1(1410)^-) - A_{CP}(\Lambda_b^0 \to (\Lambda_c^+ \to pK^-\pi^+)\pi^-)$. $1200 < m(K^-\pi^+\pi^-) < 1600$ MeV.

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
4.7±3.5±0.8	AAIJ	19AH	LHCB	pp at 7 and 8 TeV

$\Delta A_{CP}(\Lambda_b^0 \to pK^-K^+\pi^-)$

$\Delta A_{CP} \equiv A_{CP}(\Lambda_b^0 \to pK^-K^+\pi^-) - A_{CP}(\Lambda_b^0 \to (\Lambda_c^+ \to p\pi^-\pi^+)\pi^-)$

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
−6.9±4.9±0.8	[1] AAIJ	19AH	LHCB	pp at 7 and 8 TeV

[1] Full phase space.

$\Delta A_{CP}(\Lambda_b^0 \to pK^-K^+K^-)$

$\Delta A_{CP} \equiv A_{CP}(\Lambda_b^0 \to pK^-K^+K^-) - A_{CP}(\Lambda_b^0 \to (\Lambda_c^+ \to pK^-\pi^+)\pi^-)$

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
0.2±1.8±0.6	[1] AAIJ	19AH	LHCB	pp at 7 and 8 TeV

[1] Full phase space.

$\Delta A_{CP}(\Lambda_b^0 \to \Lambda(1520)\phi(1020))$

$\Delta A_{CP} \equiv A_{CP}(\Lambda_b^0 \to \Lambda(1520)\phi(1020)) - A_{CP}(\Lambda_b^0 \to (\Lambda_c^+ \to pK^-\pi^+)\pi^-)$. $1460 < m(pK^-) < 1600$ MeV and $1005 < m(K^+K^-) < 1040$ MeV.

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
4.3±5.6±0.4	AAIJ	19AH	LHCB	pp at 7 and 8 TeV

$\Delta A_{CP}(\Lambda_b^0 \to (pK^-)_{highmass}\ \phi(1020))$

$\Delta A_{CP} \equiv A_{CP}(\Lambda_b^0 \to (pK^-)_{highmass}\ \phi(1020)) - A_{CP}(\Lambda_b^0 \to (\Lambda_c p K^- \pi^+)\pi^-)$. m$(pK^-) > 1600$ MeV and $1005 <$ m$(K^+K^-) < 1040$ MeV.

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
−0.7±3.3±0.7	[1] AAIJ	19AH	LHCB	pp at 7 and 8 TeV

[1] Measurement done with $m(pK^-) > 1600$ MeV/c^2.

$\Delta A_{CP}(\Lambda_b^0 \to (pK^-K^+K^-)_{LBM})$

$\Delta A_{CP} \equiv A_{CP}(\Lambda_b^0 \to (pK^-K^+K^-)_{LBM}) - A_{CP}(\Lambda_b^0 \to (\Lambda_c^+ \to pK^-\pi^+)\pi^-)$. Two-body low invariant-mass region (LBM): m$(pK^-) < 2000$ MeVand m$(K^+K^-) < 1675$ MeV.

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
2.7±2.3±0.6	[1] AAIJ	19AH	LHCB	pp at 7 and 8 TeV

[1] Measurement done with $m(pK^-) < 2000$ MeV/c^2 and $m(K^+K^-) < 1675$ MeV/c^2.

CP AND *T* VIOLATION PARAMETERS

Measured values of the triple-product asymmetry parameters, odd under time-reversal, are defined as $A_{c(s)}(\Lambda/\phi) = (N^+_{c(s)} - N^-_{c(s)})$ / (sum) where $N^+_{c(s)}$, $N^-_{c(s)}$ are the number of Λ or ϕ candidates for which the cos(Φ) and sin(Φ) observables are positive and negative, respectively. Angles cos(Φ) and sin(Φ) are defined as in LEITNER 07.

$A_c(\Lambda)$

VALUE	DOCUMENT ID		TECN	COMMENT
−0.22±0.12±0.06	AAIJ	16J	LHCB	pp at 7, 8 TeV

$A_s(\Lambda)$

VALUE	DOCUMENT ID		TECN	COMMENT
0.13±0.12±0.05	AAIJ	16J	LHCB	pp at 7, 8 TeV

$A_c(\phi)$

VALUE	DOCUMENT ID		TECN	COMMENT
−0.01±0.12±0.03	AAIJ	16J	LHCB	pp at 7, 8 TeV

$A_s(\phi)$

VALUE	DOCUMENT ID		TECN	COMMENT
−0.07±0.12±0.01	AAIJ	16J	LHCB	pp at 7, 8 TeV

$a_{CP}(\Lambda_b^0 \to p\pi^-\pi^+\pi^-)$

Observable calculated as half of the difference between triple products for Λ_b^0 and $\overline{\Lambda}_b^0$, which is sensitive to *CP* violation.

VALUE (%)	DOCUMENT ID		TECN	COMMENT
−0.7 ±0.7 ±0.2	[1] AAIJ	20AB	LHCB	pp at 7, 8, 13 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1.15±1.45±0.32	[2] AAIJ	17H	LHCB	Repl. by AAIJ 20AB

[1] Used both triple product asymmetries and the unbinned energy test method.

[2] Measured over full phase space of the decay.

$a_{CP}(\Lambda_b^0 \to pK^-\pi^+\pi^-)$

Observable calculated as half of the difference between triple products for Λ_b^0 and $\overline{\Lambda}_b^0$, which is sensitive to CP violation.

VALUE (%)	*DOCUMENT ID*		*TECN*	*COMMENT*
−0.81±0.84±0.31	[1] AAIJ	18AG	LHCB	pp at 7, 8 TeV

[1] Measured over full phase space of the decay.

$a_{CP}(\Lambda_b^0 \to pK^-K^+\pi^-)$

Observable calculated as half of the difference between triple products for Λ_b^0 and $\overline{\Lambda}_b^0$, which is sensitive to CP violation.

VALUE (%)	*DOCUMENT ID*		*TECN*	*COMMENT*
−0.93±4.54±0.42	[1] AAIJ	17H	LHCB	pp at 7, 8 TeV

[1] Measured over full phase space of the decay.

$a_{CP}(\Lambda_b^0 \to pK^-K^+K^-)$

Observable calculated as half of the difference between triple products for Λ_b^0 and $\overline{\Lambda}_b^0$, which is sensitive to CP violation.

VALUE (%)	*DOCUMENT ID*		*TECN*	*COMMENT*
1.12±1.51±0.32	[1] AAIJ	18AG	LHCB	pp at 7, 8 TeV

[1] Measured over full phase space of the decay.

$a_{CP}(\Lambda_b^0 \to pK^-\mu^+\mu^-)$

VALUE (%)	*DOCUMENT ID*		*TECN*	*COMMENT*
1.2±5.0±0.7	AAIJ	17T	LHCB	pp at 7, 8 TeV

P VIOLATION PARAMETERS

Observables calculated as average of the triple products for Λ_b^0 and $\overline{\Lambda}_b^0$, which is sensitive to parity violation.

$a_{P}(\Lambda_b^0 \to p\pi^-\pi^+\pi^-)$

VALUE (%)	*DOCUMENT ID*		*TECN*	*COMMENT*
−4.0 ±0.7 ±0.2	[1] AAIJ	20AB	LHCB	pp at 7, 8, 13 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
−3.71±1.45±0.32	[2] AAIJ	17H	LHCB	Repl. by AAIJ 20AB

[1] Used both triple product asymmetries and the unbinned energy test method.
[2] Measured over full phase space of the decay.

$a_{P}(\Lambda_b^0 \to pK^-\pi^+\pi^-)$

VALUE (%)	*DOCUMENT ID*		*TECN*	*COMMENT*
−0.60±0.84±0.31	[1] AAIJ	18AG	LHCB	pp at 7, 8 TeV

[1] Measured over full phase space of the decay.

$a_{P}(\Lambda_b^0 \to pK^-K^+\pi^-)$

VALUE (%)	*DOCUMENT ID*		*TECN*	*COMMENT*
3.62±4.54±0.42	[1] AAIJ	17H	LHCB	pp at 7, 8 TeV

[1] Measured over full phase space of the decay.

$a_P(\Lambda_b^0 \to pK^- K^+ K^-)$

VALUE (%)	DOCUMENT ID	TECN	COMMENT
−1.56±1.51±0.32	[1] AAIJ 18AG	LHCB	pp at 7, 8 TeV

[1] Measured over full phase space of the decay.

$a_P(\Lambda_b^0 \to pK^- \mu^+ \mu^-)$

VALUE (%)	DOCUMENT ID	TECN	COMMENT
−4.8±5.0±0.7	AAIJ 17T	LHCB	pp at 7, 8 TeV

Λ_b^0 DECAY PARAMETERS

See the note on "Baryon Decay Parameters" in the neutron Listings.

α decay parameter for $\Lambda_b \to J/\psi \Lambda$

VALUE	DOCUMENT ID	TECN	COMMENT
−0.017±0.026 OUR AVERAGE			
$-0.022^{+0.027}_{-0.026}$	[1] AAIJ 20O	LHCB	pp at 7, 8, 13 TeV
−0.14 ±0.14 ±0.10	[2] SIRUNYAN 18R	CMS	pp at 7, 8 TeV
0.30 ±0.16 ±0.06	[3] AAD 14L	ATLS	pp at 7 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.05 ±0.17 ±0.07	[4] AAIJ 13AG	LHCB	Repl. by AAIJ 20O

[1] Extracted using a Bayesian analysis. The most probable value is given as −0.022, with a 68% credibility interval [-0.048, 0.005]. Transverse polarizations of Λ_b^0 of −0.004 (68% credibility interval [-0.064, 0.051]), 0.001 (68% credibility interval [-0.035, 0.045]), and 0.032 (68% credibility interval [-0.011, 0.065]) are also reported at 7 TeV, 8 TeV and 13 TeV, respectively. Note that both statistical and systematic uncertainties are included.
[2] An angular analysis of $\Lambda_b \to J/\psi \Lambda$ decay is performed. Note that the sign of α in CMS definition is the opposite to that used by AAIJ 13AG and AAD 14L. Λ_b transverse production polarization of 0.00 ± 0.06 ± 0.06 is also reported, as well as squares of the helicity amplitudes.
[3] An angular analysis of $\Lambda_b \to J/\psi \Lambda$ decay is performed and magnitudes of all helicity amplitudes are also reported.
[4] An angular analysis of $\Lambda_b \to J/\psi \Lambda$ decay is performed and a Λ_b transverse production polarization of 0.06 ± 0.07 ± 0.02 is also reported.

$f_L(\mu\mu)$ longitudinal polarization fraction in $\Lambda_b \to \Lambda \mu^+ \mu^-$

VALUE	DOCUMENT ID	TECN	COMMENT
$\mathbf{0.61^{+0.11}_{-0.14}\pm0.03}$	[1] AAIJ 15AE	LHCB	pp at 7, 8 TeV

[1] AAIJ 15AE measurement covers $15.0 < q^2 < 20.0$ GeV^2/c^4.

FORWARD-BACKWARD ASYMMETRIES

The forward-backward assymmetry is defined as $A_{FB}(\Lambda_b^0)$ = [N(F) − N(B)] / [N(F) + N(B)], where the forward (F) direction corresponds to a particle (Λ_b^0 or Λ_b^-) sharing valence quark flavors with a beam particle with the same sign of rapidity.

$A_{FB}(\Lambda_b^0 \to J/\psi \Lambda)$

VALUE	DOCUMENT ID	TECN	COMMENT
0.04±0.07±0.02	[1] ABAZOV 15I	D0	$p\overline{p}$ at 1.96 TeV

[1] The measured asymmetry integrated over rapidity y in the range of $0.1 < |y| < 2.0$.

$A^{\ell}_{FB}(\mu\mu)$ in $\Lambda_b \to \Lambda\mu^+\mu^-$

VALUE	DOCUMENT ID		TECN	COMMENT
$-0.39\pm0.04\pm0.01$	[1] AAIJ	18AP	LHCB	pp at 7, 8, 13 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$-0.05\pm0.09\pm0.03$	[2] AAIJ	15AE	LHCB	Repl. by AAIJ 18AP.

[1] The measurement covers $15.0 < q^2 < 20.0$ GeV^2/c^4.

[2] AAIJ 15AE measurement covers $15.0 < q^2 < 20.0$ GeV^2/c^4.

$\Delta(A^{\ell}_{FB}(\mu\mu))$ in $\Lambda_b \to \Lambda\mu^+\mu^-$

Difference of asymmetries $A^{\ell}_{FB}(\mu\mu)$ in $\Lambda_b \to \Lambda\mu^+\mu^-$ between Λ_b and $\overline{\Lambda}_b$ decays

VALUE	DOCUMENT ID		TECN	COMMENT
$-0.05\pm0.09\pm0.03$	AAIJ	18AO	LHCB	pp at 7, 8 TeV

$A^{h}_{FB}(p\pi)$ in $\Lambda_b \to \Lambda(p\pi)\mu^+\mu^-$

VALUE	DOCUMENT ID		TECN	COMMENT
$-0.30\pm0.05\pm0.02$	[1] AAIJ	18AP	LHCB	pp at 7, 8, 13 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$-0.29\pm0.07\pm0.03$	[2] AAIJ	15AE	LHCB	Repl. by AAIJ 18AP.

[1] The measurement covers $15.0 < q^2 < 20.0$ GeV^2/c^4.

[2] AAIJ 15AE measurement covers $15.0 < q^2 < 20.0$ GeV^2/c^4.

$A^{\ell h}_{FB}$ in $\Lambda_b \to \Lambda\mu^+\mu^-$

VALUE	DOCUMENT ID		TECN	COMMENT
$0.25\pm0.04\pm0.01$	[1] AAIJ	18AP	LHCB	pp at 7, 8, 13 TeV

[1] The measurement covers $15.0 < q^2 < 20.0$ GeV^2/c^4.

$\Lambda^0_b - \overline{\Lambda}^0_b$ Production Asymmetry

$$A_P(\Lambda^0_b) = [\sigma(\Lambda^0_b) - \sigma(\overline{\Lambda}^0_b)] \;/\; [\sigma(\Lambda^0_b) + \sigma(\overline{\Lambda}^0_b)]$$

$A_P(\Lambda^0_b)$

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
1.4 ±0.4 OUR AVERAGE	Error includes scale factor of 1.8.			
1.92 ± 0.35	[1] AAIJ	21AJ	LHCB	pp at 7 TeV
1.09 ± 0.29	[1] AAIJ	21AJ	LHCB	pp at 8 TeV
$-0.11\pm2.53\pm1.08$	[2] AAIJ	17BF	LHCB	pp at 7 TeV
$3.44\pm1.61\pm0.76$	[2] AAIJ	17BF	LHCB	pp at 8 TeV

[1] Integrated over the kinematic range $2 < p_T < 27$ GeV/c and $2.15 < y < 4.10$.

[2] Indirect determination in kinematic range $2 < p_T < 30$ GeV/c and $2.1 < \eta < 4.5$ from production asymmetries of B^+, B^0 and B^0_s.

Λ_b^0 REFERENCES

AAIJ	21AD	PR D104 112008	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	21AJ	JHEP 2110 060	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	21B	PL B815 136172	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	21R	JHEP 2105 095	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	20AB	PR D102 051101	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	20AK	PR D102 112012	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	20M	JHEP 2005 040	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	20O	JHEP 2006 110	R. Aaij *et al.*	(LHCb Collab.)
SIRUNYAN	20H	PL B802 135203	A.M. Sirunyan *et al.*	(CMS Collab.)
AAIJ	19AH	EPJ C79 745	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	19AN	JHEP 1909 028	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	19F	JHEP 1903 126	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	19Z	PRL 123 031801	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	18AF	JHEP 1808 131	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	18AG	JHEP 1808 039	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	18AO	JHEP 1809 145 (errat.)	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	18AP	JHEP 1809 146	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	18AW	PL B784 101	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	18AX	PL B787 124	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	18Q	JHEP 1802 098	R. Aaij *et al.*	(LHCb Collab.)
PDG	18	PR D98 030001	M. Tanabashi *et al.*	(PDG Collab.)
SIRUNYAN	18BY	EPJ C78 457	A.M. Sirunyan *et al.*	(CMS Collab.)
SIRUNYAN	18R	PR D97 072010	A.M. Sirunyan *et al.*	(CMS Collab.)
AAIJ	17AM	PRL 119 062001	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	17BF	PL B774 139	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	17H	NATP 13 391	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	17P	JHEP 1704 029	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	17S	JHEP 1705 030	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	17T	JHEP 1706 108	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	16	JHEP 1601 012	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	16A	CP C40 011001	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	16J	PL B759 282	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	16W	JHEP 1605 081	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	16Y	JHEP 1605 132	R. Aaij *et al.*	(LHCb Collab.)
AAD	15CH	PL B751 63	G. Aad *et al.*	(ATLAS Collab.)
AAIJ	15AE	JHEP 1506 115	R. Aaji *et al.*	(LHCb Collab.)
Also		JHEP 1809 145 (errat.)	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	15AH	JHEP 1509 006	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	15BG	NATP 11 743	R. Aaij *et al.*	(LHCb Collab.)
ABAZOV	15I	PR D91 072008	V.M. Abazov *et al.*	(D0 Collab.)
AAD	14L	PR D89 092009	G. Aad *et al.*	(ATLAS Collab.)
AAIJ	14AA	PRL 112 202001	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	14E	JHEP 1404 114	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	14H	PR D89 032001	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	14I	JHEP 1408 143	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	14K	JHEP 1407 103	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	14Q	JHEP 1404 087	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	14U	PL B734 122	R. Aaij *et al.*	(LHCb Collab.)
AALTONEN	14B	PR D89 072014	T. Aaltonen *et al.*	(CDF Collab.)
AALTONEN	14P	PRL 113 242001	T. Aaltonen *et al.*	(CDF Collab.)
PDG	14	CP C38 070001	K. Olive *et al.*	(PDG Collab.)
AAD	13U	PR D87 032002	G. Aad *et al.*	(ATLAS Collab.)
AAIJ	13AG	PL B724 27	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	13AJ	PL B725 25	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	13AV	PRL 110 182001	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	13BB	PRL 111 102003	R. Aaij *et al.*	(LHCb Collab.)
CHATRCHYAN	13AC	JHEP 1307 163	S. Chatrchyan *et al.*	(CMS Collab.)
AAIJ	12AR	JHEP 1210 037	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	12E	PL B708 241	R. Aaij *et al.*	(LHCb Collab.)
AALTONEN	12A	PR D85 032003	T. Aaltonen *et al.*	(CDF Collab.)
ABAZOV	12U	PR D85 112003	V.M. Abazov *et al.*	(D0 Collab.)
AAIJ	11E	PR D84 092001	R. Aaij *et al.*	(LHCb Collab.)
Also		PR D85 039904 (errat.)	R. Aaij *et al.*	(LHCb Collab.)
AALTONEN	11	PRL 106 121804	T. Aaltonen *et al.*	(CDF Collab.)
AALTONEN	11AI	PRL 107 201802	T. Aaltonen *et al.*	(CDF Collab.)
AALTONEN	11N	PRL 106 181802	T. Aaltonen *et al.*	(CDF Collab.)
ABAZOV	11O	PR D84 031102	V.M. Abazov *et al.*	(D0 Collab.)
AALTONEN	10B	PRL 104 102002	T. Aaltonen *et al.*	(CDF Collab.)

AALTONEN	09C	PRL 103 031801	T. Aaltonen *et al.*	(CDF Collab.)
AALTONEN	09E	PR D79 032001	T. Aaltonen *et al.*	(CDF Collab.)
ABAZOV	07S	PRL 99 142001	V.M. Abazov *et al.*	(D0 Collab.)
ABAZOV	07U	PRL 99 182001	V.M. Abazov *et al.*	(D0 Collab.)
ABULENCIA	07A	PRL 98 122001	A. Abulencia *et al.*	(FNAL CDF Collab.)
ABULENCIA	07B	PRL 98 122002	A. Abulencia *et al.*	(FNAL CDF Collab.)
LEITNER	07	NPBPS 174 169	O. Leitner, Z.J. Ajaltouni	
ACOSTA	06	PRL 96 202001	D. Acosta *et al.*	(CDF Collab.)
ABAZOV	05C	PRL 94 102001	V.M. Abazov *et al.*	(D0 Collab.)
ACOSTA	05O	PR D72 051104	D. Acosta *et al.*	(CDF Collab.)
ABDALLAH	04A	PL B585 63	J. Abdallah *et al.*	(DELPHI Collab.)
ACOSTA	02G	PR D66 112002	D. Acosta *et al.*	(CDF Collab.)
ABREU	99W	EPJ C10 185	P. Abreu *et al.*	(DELPHI Collab.)
ACKERSTAFF	98G	PL B426 161	K. Ackerstaff *et al.*	(OPAL Collab.)
BARATE	98D	EPJ C2 197	R. Barate *et al.*	(ALEPH Collab.)
ABE	97B	PR D55 1142	F. Abe *et al.*	(CDF Collab.)
ABE	96M	PRL 77 1439	F. Abe *et al.*	(CDF Collab.)
ABREU	96D	ZPHY C71 199	P. Abreu *et al.*	(DELPHI Collab.)
ABREU	96N	PL B374 351	P. Abreu *et al.*	(DELPHI Collab.)
ADAM	96D	ZPHY C72 207	W. Adam *et al.*	(DELPHI Collab.)
BUSKULIC	96L	PL B380 442	D. Buskulic *et al.*	(ALEPH Collab.)
BUSKULIC	96V	PL B384 471	D. Buskulic *et al.*	(ALEPH Collab.)
PDG	96	PR D54 1	R. M. Barnett *et al.*	(PDG Collab.)
ABREU	95S	ZPHY C68 375	P. Abreu *et al.*	(DELPHI Collab.)
AKERS	95K	PL B353 402	R. Akers *et al.*	(OPAL Collab.)
BUSKULIC	95L	PL B357 685	D. Buskulic *et al.*	(ALEPH Collab.)
ABE	93B	PR D47 2639	F. Abe *et al.*	(CDF Collab.)
BUSKULIC	92E	PL B294 145	D. Buskulic *et al.*	(ALEPH Collab.)
ALBAJAR	91E	PL B273 540	C. Albajar *et al.*	(UA1 Collab.)
BARI	91	NC 104A 1787	G. Bari *et al.*	(CERN R422 Collab.)
ARENTON	86	NP B274 707	M.W. Arenton *et al.*	(ARIZ, NDAM, VAND)
BASILE	81	LNC 31 97	M. Basile *et al.*	(CERN R415 Collab.)