Λ

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

We have omitted some results that have been superseded by later experiments. See our earlier editions.

Λ MASS

The fit uses Λ, Σ^+, Σ^0, Σ^- mass and mass-difference measurements.

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
1115.683±0.006 OUR FIT					
1115.683±0.006 OUR AVERAGE					
1115.678±0.006±0.006	20k	HARTOUNI	94	SPEC	pp 27.5 GeV/c
1115.690±0.008±0.006	18k	[1] HARTOUNI	94	SPEC	pp 27.5 GeV/c
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1115.59 ±0.08	935	HYMAN	72	HEBC	
1115.39 ±0.12	195	MAYEUR	67	EMUL	
1115.6 ±0.4		LONDON	66	HBC	
1115.65 ±0.07	488	[2] SCHMIDT	65	HBC	
1115.44 ±0.12		[3] BHOWMIK	63	RVUE	

[1] We assume *CPT* invariance: this is the $\overline{\Lambda}$ mass as measured by HARTOUNI 94. See below for the fractional mass difference, testing *CPT*.

[2] The SCHMIDT 65 masses have been reevaluated using our April 1973 proton and $K^\pm$ and $\pi^\pm$ masses. P. Schmidt, private communication (1974).

[3] The mass has been raised 35 keV to take into account a 46 keV increase in the proton mass and an 11 keV decrease in the $\pi^\pm$ mass (note added Reviews of Modern Physics **39** 1 (1967)).

$(m_\Lambda - m_{\overline{\Lambda}})\ /\ m_\Lambda$

A test of *CPT* invariance.

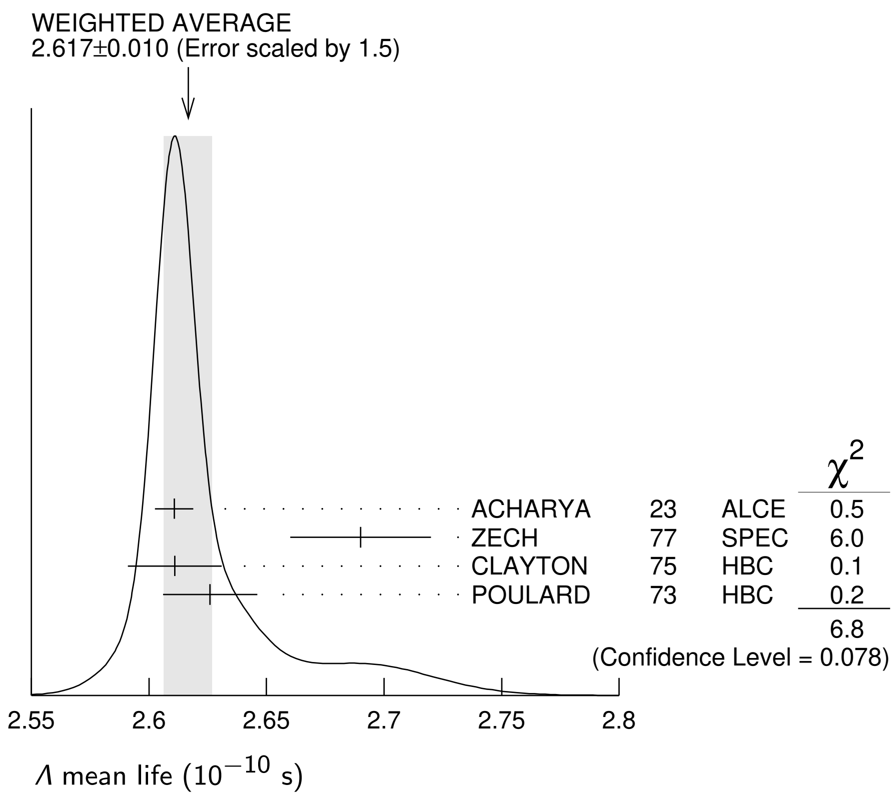
VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
− 0.1 ± 1.1 OUR AVERAGE	Error includes scale factor of 1.6.				
+ 1.3 ± 1.2	31k	[1] RYBICKI	96	NA32	π^- Cu, 230 GeV
− 1.08± 0.90		HARTOUNI	94	SPEC	pp 27.5 GeV/c
4.5 ± 5.4		CHIEN	66	HBC	6.9 GeV/c $\overline{p}p$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
−26 ±13		BADIER	67	HBC	2.4 GeV/c $\overline{p}p$

[1] RYBICKI 96 is an analysis of old ACCMOR (NA32) data.

Λ MEAN LIFE

Measurements with an error $\geq$ 0.1 $\times 10^{-10}$ s have been omitted altogether, and only the highest-statistics are used.

VALUE (10^{-10} s)	EVTS	DOCUMENT ID		TECN	COMMENT
2.617 ±0.010 OUR AVERAGE		Error includes scale factor of 1.5. See the ideogram below.			
2.6107±0.0037±0.0072	188M	ACHARYA	23	ALCE	Pb-Pb → ΛX or $\overline{\Lambda} X$ at 5.02 TeV
2.69 ±0.03	53k	ZECH	77	SPEC	Neutral hyperon beam
2.611 ±0.020	34k	CLAYTON	75	HBC	0.96–1.4 GeV/c $K^- p$
2.626 ±0.020	36k	POULARD	73	HBC	0.4–2.3 GeV/c $K^- p$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
2.69 ±0.05	6582	ALTHOFF	73B	OSPK	$\pi^+ n \rightarrow \Lambda K^+$
2.54 ±0.04	4572	BALTAY	71B	HBC	$K^- p$ at rest
2.535 ±0.035	8342	GRIMM	68	HBC	
2.47 ±0.08	2600	HEPP	68	HBC	
2.35 ±0.09	916	BURAN	66	HLBC	
2.452 $^{+0.056}_{-0.054}$	2213	ENGELMANN	66	HBC	
2.59 ±0.09	794	HUBBARD	64	HBC	
2.59 ±0.07	1378	SCHWARTZ	64	HBC	
2.36 ±0.06	2239	BLOCK	63	HEBC	



$(\tau_\Lambda - \tau_{\overline{\Lambda}}) / \tau_\Lambda$

A test of *CPT* invariance.

VALUE (units 10^{-3})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
0.9± 3.2 OUR AVERAGE					
1.3± 2.8±2.1	188M	ACHARYA	23	ALCE	Pb-Pb → ΛX or $\overline{\Lambda} X$ at 5.02 TeV
− 1.8± 6.6±5.6		BARNES	96	CNTR	LEAR $\overline{p}p \to \overline{\Lambda}\Lambda$
44 ±85		BADIER	67	HBC	2.4 GeV/c $\overline{p}p$

Λ MAGNETIC MOMENT

See the "Quark Model" review. Measurements with an error $\geq 0.15\ \mu_N$ have been omitted.

VALUE (μ_N)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
−0.613 ±0.004 OUR AVERAGE					
−0.606 ±0.015	200k	COX	81	SPEC	
−0.6138±0.0047	3M	SCHACHIN...	78	SPEC	
−0.59 ±0.07	350k	HELLER	77	SPEC	
−0.57 ±0.05	1.2M	BUNCE	76	SPEC	
−0.66 ±0.07	1300	DAHL-JENSEN	71	EMUL	200 kG field

Λ ELECTRIC DIPOLE MOMENT

A nonzero value is forbidden by both *T* invariance and *P* invariance.

VALUE (10^{-16} e cm)	*CL%*	*DOCUMENT ID*		*TECN*
< 1.5	95	[1] PONDROM	81	SPEC
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<100	95	[2] BARONI	71	EMUL
<500	95	GIBSON	66	EMUL

[1] PONDROM 81 measures $(-3.0 \pm 7.4) \times 10^{-17}$ e-cm.
[2] BARONI 71 measures $(-5.9 \pm 2.9) \times 10^{-15}$ e-cm.

Λ DECAY MODES

	Mode		Fraction (Γ_i/Γ)	Confidence level
Γ_1	$p\pi^-$		(64.1 ±0.5) %	
Γ_2	$n\pi^0$		(35.9 ±0.5) %	
Γ_3	$n\gamma$		(8.3 ±0.7) × 10^{-4}	
Γ_4	$p\pi^-\gamma$	[a]	(8.5 ±1.4) × 10^{-4}	
Γ_5	$pe^-\overline{\nu}_e$		(8.34±0.14) × 10^{-4}	
Γ_6	$p\mu^-\overline{\nu}_\mu$		(1.51±0.19) × 10^{-4}	

Lepton (L) and/or Baryon (B) number violating decay modes

Γ_7	$\pi^+ e^-$	L,B	$<$	6	$\times 10^{-7}$	90%
Γ_8	$\pi^+ \mu^-$	L,B	$<$	6	$\times 10^{-7}$	90%
Γ_9	$\pi^- e^+$	L,B	$<$	4	$\times 10^{-7}$	90%
Γ_{10}	$\pi^- \mu^+$	L,B	$<$	6	$\times 10^{-7}$	90%
Γ_{11}	$K^+ e^-$	L,B	$<$	2	$\times 10^{-6}$	90%
Γ_{12}	$K^+ \mu^-$	L,B	$<$	3	$\times 10^{-6}$	90%
Γ_{13}	$K^- e^+$	L,B	$<$	2	$\times 10^{-6}$	90%
Γ_{14}	$K^- \mu^+$	L,B	$<$	3	$\times 10^{-6}$	90%
Γ_{15}	$K^0_S \nu$	L,B	$<$	2	$\times 10^{-5}$	90%
Γ_{16}	$\overline{p} \pi^+$	B	$<$	9	$\times 10^{-7}$	90%
Γ_{17}	invisible		$<$	7.4	$\times 10^{-5}$	90%

[a] See the Listings below for the pion momentum range used in this measurement.

CONSTRAINED FIT INFORMATION

An overall fit to 4 branching ratios uses 11 measurements and one constraint to determine 3 parameters. The overall fit has a $\chi^2 =$ 6.9 for 9 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_2	−100	
x_6	0	0
	x_1	x_2

Λ BRANCHING RATIOS

$\Gamma(p\pi^-)/\Gamma(N\pi)$ — $\Gamma_1/(\Gamma_1+\Gamma_2)$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.641±0.005 OUR FIT					
0.640±0.005 OUR AVERAGE					
0.646±0.008	4572	BALTAY	71B	HBC	$K^- p$ at rest
0.635±0.007	6736	DOYLE	69	HBC	$\pi^- p \to \Lambda K^0$
0.643±0.016	903	HUMPHREY	62	HBC	
0.624±0.030		CRAWFORD	59B	HBC	$\pi^- p \to \Lambda K^0$

$\Gamma(n\pi^0)/\Gamma(N\pi)$ — $\Gamma_2/(\Gamma_1+\Gamma_2)$

VALUE	EVTS	DOCUMENT ID		TECN
0.359±0.005 OUR FIT				
0.310±0.028 OUR AVERAGE				
0.35 ±0.05		BROWN	63	HLBC
0.291±0.034	75	CHRETIEN	63	HLBC

$\Gamma(n\gamma)/\Gamma_{total}$ — Γ_3/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
0.832±0.038±0.054	1221	[1] ABLIKIM	22AJ	BES3	$J/\psi \to \Lambda\overline{\Lambda}$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1.75 ±0.15	1816	LARSON	93	SPEC	$K^- p$ at rest
1.78 ±0.24 $^{+0.14}_{-0.16}$	287	NOBLE	92	SPEC	See LARSON 93

[1] This ABLIKIM 22AJ value is a factor of 2.1 smaller and differs by 5.6σ from the previous LARSON 93 value.

$\Gamma(n\gamma)/\Gamma(n\pi^0)$ — Γ_3/Γ_2

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
2.86±0.74±0.57	24	BIAGI	86	SPEC	SPS hyperon beam

$\Gamma(p\pi^-\gamma)/\Gamma(p\pi^-)$ — Γ_4/Γ_1

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.32±0.22	72	BAGGETT	72C	HBC	$\pi^- < 95$ MeV/c

$\Gamma(pe^-\overline{\nu}_e)/\Gamma(p\pi^-)$ — Γ_5/Γ_1

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.301±0.019 OUR AVERAGE					
1.335±0.056	7111	BOURQUIN	83	SPEC	SPS hyperon beam
1.313±0.024	10k	WISE	80	SPEC	
1.23 ±0.11	544	LINDQUIST	77	SPEC	$\pi^- p \to K^0\Lambda$
1.27 ±0.07	1089	KATZ	73	HBC	
1.31 ±0.06	1078	ALTHOFF	71	OSPK	
1.17 ±0.13	86	[1] CANTER	71	HBC	$K^- p$ at rest
1.20 ±0.12	143	[2] MALONEY	69	HBC	
1.17 ±0.18	120	[2] BAGLIN	64	FBC	K^- freon 1.45 GeV/c
1.23 ±0.20	150	[2] ELY	63	FBC	
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1.32 ±0.15	218	[1] LINDQUIST	71	OSPK	See LINDQUIST 77

[1] Changed by us from $\Gamma(pe^-\overline{\nu}_e)/\Gamma(N\pi)$ assuming the authors used $\Gamma(\Lambda \to p\pi^-)/\Gamma(\text{total}) = 2/3$.

[2] Changed by us from $\Gamma(pe^-\overline{\nu}_e)/\Gamma(N\pi)$ because $\Gamma(pe^-\nu)/\Gamma(p\pi^-)$ is the directly measured quantity.

$\Gamma(p\mu^-\overline{\nu}_\mu)/\Gamma_{total}$ — Γ_6/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
1.51±0.19 OUR FIT					
1.48±0.21±0.08	64	[1] ABLIKIM	21AG	BES3	$J/\psi \to \Lambda\overline{\Lambda}$

[1] ABLIKIM 21AG use $\overline{\Lambda} \to \overline{p}\pi^+$ decay mode as the double tag identifier and thus as indirect normalization.

$\Gamma(p\mu^-\overline{\nu}_\mu)/\Gamma(N\pi)$ **$\Gamma_6/(\Gamma_1+\Gamma_2)$**

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
1.51±0.19 OUR FIT					
1.57±0.35 OUR AVERAGE					
1.4 ±0.5	14	BAGGETT	72B	HBC	$K^- p$ at rest
2.4 ±0.8	9	CANTER	71B	HBC	$K^- p$ at rest
1.3 ±0.7	3	LIND	64	RVUE	
1.5 ±1.2	2	RONNE	64	FBC	

Lepton (L) and/or Baryon (B) number violating decay modes

$\Gamma(\pi^+ e^-)/\Gamma_{total}$ **Γ_7/Γ**

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<6 \times 10^{-7}$	90	[1] MCCRACKEN	15	CLAS	$\gamma p \to K^+ \Lambda$

[1] Uses B($\Lambda \to p\pi^-$) = (63.9 ± 0.5)% for normalization mode.

$\Gamma(\pi^+ \mu^-)/\Gamma_{total}$ **Γ_8/Γ**

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<6 \times 10^{-7}$	90	[1] MCCRACKEN	15	CLAS	$\gamma p \to K^+ \Lambda$

[1] Uses B($\Lambda \to p\pi^-$) = (63.9 ± 0.5)% for normalization mode.

$\Gamma(\pi^- e^+)/\Gamma_{total}$ **Γ_9/Γ**

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<4 \times 10^{-7}$	90	[1] MCCRACKEN	15	CLAS	$\gamma p \to K^+ \Lambda$

[1] Uses B($\Lambda \to p\pi^-$) = (63.9 ± 0.5)% for normalization mode.

$\Gamma(\pi^- \mu^+)/\Gamma_{total}$ **Γ_{10}/Γ**

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<6 \times 10^{-7}$	90	[1] MCCRACKEN	15	CLAS	$\gamma p \to K^+ \Lambda$

[1] Uses B($\Lambda \to p\pi^-$) = (63.9 ± 0.5)% for normalization mode.

$\Gamma(K^+ e^-)/\Gamma_{total}$ **Γ_{11}/Γ**

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<2 \times 10^{-6}$	90	[1] MCCRACKEN	15	CLAS	$\gamma p \to K^+ \Lambda$

[1] Uses B($\Lambda \to p\pi^-$) = (63.9 ± 0.5)% for normalization mode.

$\Gamma(K^+ \mu^-)/\Gamma_{total}$ **Γ_{12}/Γ**

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<3 \times 10^{-6}$	90	[1] MCCRACKEN	15	CLAS	$\gamma p \to K^+ \Lambda$

[1] Uses B($\Lambda \to p\pi^-$) = (63.9 ± 0.5)% for normalization mode.

$\Gamma(K^- e^+)/\Gamma_{total}$ **Γ_{13}/Γ**

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<2 \times 10^{-6}$	90	[1] MCCRACKEN	15	CLAS	$\gamma p \to K^+ \Lambda$

[1] Uses B($\Lambda \to p\pi^-$) = (63.9 ± 0.5)% for normalization mode.

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

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<3 × 10^{-6}	90	[1] MCCRACKEN 15	CLAS	$\gamma p \to K^+ \Lambda$

[1] Uses B($\Lambda \to p\pi^-$) = (63.9 ± 0.5)% for normalization mode.

$\Gamma(K^0_S \nu)/\Gamma_{total}$ — Γ_{15}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<2 × 10^{-5}	90	[1] MCCRACKEN 15	CLAS	$\gamma p \to K^+ \Lambda$

[1] Uses B($\Lambda \to p\pi^-$) = (63.9 ± 0.5)% for normalization mode.

$\Gamma(\overline{p}\pi^+)/\Gamma_{total}$ — Γ_{16}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<9 × 10^{-7}	90	[1] MCCRACKEN 15	CLAS	$\gamma p \to K^+ \Lambda$

[1] Uses B($\Lambda \to p\pi^-$) = (63.9 ± 0.5)% for normalization mode.

$\Gamma(\text{invisible})/\Gamma_{total}$ — Γ_{17}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<7.4 × 10^{-5}	90	ABLIKIM 22P	BES3	$J/\psi \to \Lambda\overline{\Lambda}$

Λ *CP*-violating decay-rate asymmetries

This is the difference between Λ and $\overline{\Lambda}$ decay rates to state f and $\overline{f}$ divided by the sum of the rates:
$A_{CP}(f)$ = [(B($\Lambda \to f$)) − (B($\overline{\Lambda} \to \overline{f}$))]/Sum.

$A_{CP}(p\mu^-\overline{\nu}_\mu)$ in $\Lambda \to p\mu^-\overline{\nu}_\mu$, $\overline{\Lambda} \to \overline{p}\mu^+\nu_\mu$

VALUE	DOCUMENT ID	TECN	COMMENT
0.02±0.14±0.02	ABLIKIM 21AG	BES3	$J/\psi \to \Lambda\overline{\Lambda}$

Limit on $\overline{\Lambda}\Lambda$ oscillations

Upper limit for the oscillation rate of ($\overline{\Lambda} \to \Lambda$) hyperons. A test of baryon number nonconservation. We quote the oscillation parameter $\delta m_{\overline{\Lambda}\Lambda}$, deduced from the oscillation rate P(Λ) and the hyperon lifetime τ_Λ, as $(\delta m_{\overline{\Lambda}\Lambda})^2$ = P(Λ) / $2\tau^2_\Lambda$.

VALUE (GeV)	CL%	DOCUMENT ID	TECN	COMMENT
<3.8 × 10^{-18}	90	[1] ABLIKIM 23BM	BES3	$J/\psi \to pK^-\overline{\Lambda}$

[1] ABLIKIM 23BM quote the oscillation rate limit P(Λ) < 4.4×10^{-6} and calculate the oscillation parameter $\delta m_{\overline{\Lambda}\Lambda}$ given here.

Λ DECAY PARAMETERS

See the "Note on Baryon Decay Parameters" in the neutron Listings. Some early results have been omitted.

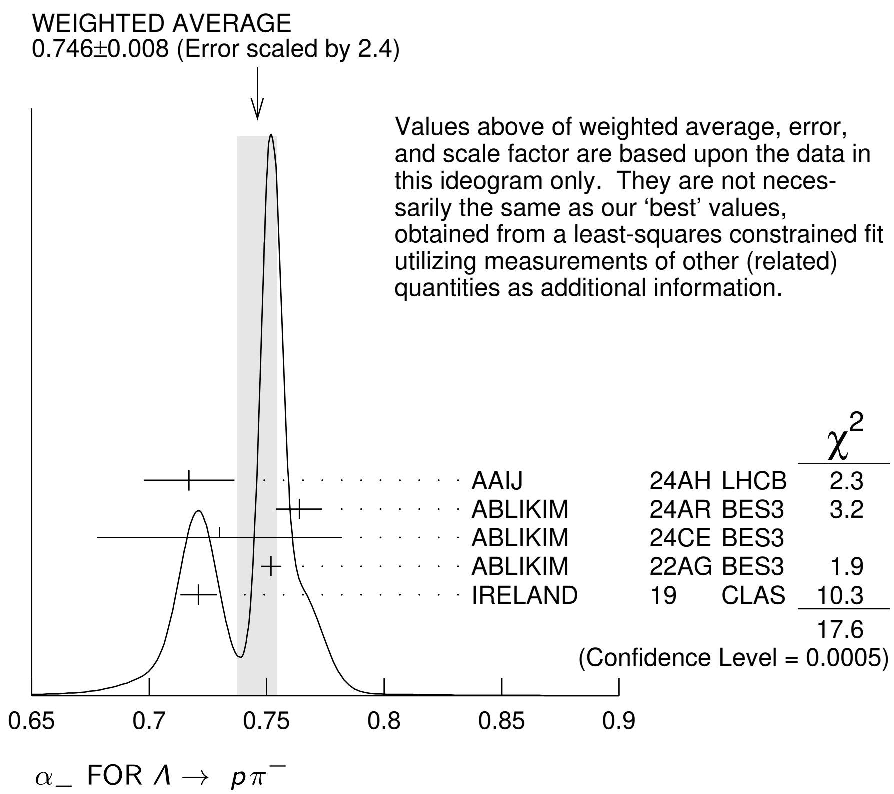
α_- FOR $\Lambda \to p\pi^-$

OUR FIT value is obtained from measurements of $\alpha(\Xi^-)$, $\alpha_-(\Lambda)$, and $\alpha(\Xi^-)\alpha_-(\Lambda)$.

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.749 ±0.008 OUR FIT Error includes scale factor of 2.4.				
0.746 ±0.008 OUR AVERAGE Error includes scale factor of 2.4. See the ideogram below.				
0.717 ±0.017 ±0.009	27k	AAIJ 24AH	LHCB	$\Lambda_b \to \Lambda_c \to \Lambda h^+$

0.764 $\pm$0.008 $^{+0.005}_{-0.006}$	144k		ABLIKIM	24AR	BES3	$J/\psi \rightarrow \Xi\overline{\Xi} \rightarrow \Lambda\overline{\Lambda}\pi\pi$
0.730 $\pm$0.051 $\pm$0.011	1.1M		ABLIKIM	24CE	BES3	$J/\psi \rightarrow \Sigma\overline{\Sigma} \rightarrow \Lambda\overline{\Lambda}\gamma\gamma$
0.7519$\pm$0.0036$\pm$0.0024	3.2M		ABLIKIM	22AG	BES3	$J/\psi \rightarrow \Lambda\overline{\Lambda}$
0.721 $\pm$0.006 $\pm$0.005		[1]	IRELAND	19	CLAS	K production
• • • We do not use the following data for averages, fits, limits, etc. • • •						
0.757 $\pm$0.011 $\pm$0.008	73k		ABLIKIM	22AD	BES3	$J/\psi \rightarrow \Xi\overline{\Xi} \rightarrow \Lambda\overline{\Lambda}\pi\pi$
0.74 $^{+0.04}_{-0.03}$			AAIJ	20O	LHCB	$\Lambda_b \rightarrow J/\psi\Lambda$
0.750 $\pm$0.009 $\pm$0.004	420k		ABLIKIM	19BJ	BES3	$J/\psi \rightarrow \Lambda\overline{\Lambda}$
0.584 $\pm$0.046	8500		ASTBURY	75	SPEC	
0.649 $\pm$0.023	10325		CLELAND	72	OSPK	
0.67 $\pm$0.06	3520		DAUBER	69	HBC	From Ξ decay
0.645 $\pm$0.017	10130		OVERSETH	67	OSPK	Λ from $\pi^- p$
0.62 $\pm$0.07	1156		CRONIN	63	CNTR	Λ from $\pi^- p$

[1] This is a new analysis based on existing kaon photoproduction data of the CLAS collaboration and using spin algebra constraints.



α_+ FOR $\overline{\Lambda} \rightarrow \overline{p}\pi^+$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
−0.758 ±0.005 OUR AVERAGE		Error includes scale factor of 1.2.		
−0.748 $\pm$0.016 $\pm$0.007	27k	AAIJ 24AH	LHCB	$\Lambda_b \rightarrow \Lambda_c \rightarrow \Lambda h^+$
−0.774 $\pm$0.009 $^{+0.005}_{-0.005}$	123k	ABLIKIM 24AR	BES3	$J/\psi \rightarrow \Xi\overline{\Xi} \rightarrow \Lambda\overline{\Lambda}\pi\pi$
−0.776 $\pm$0.054 $\pm$0.010	1.1M	ABLIKIM 24CE	BES3	$J/\psi \rightarrow \Sigma\overline{\Sigma} \rightarrow \Lambda\overline{\Lambda}\gamma\gamma$
−0.7559$\pm$0.0036$\pm$0.0030	3.2M	ABLIKIM 22AG	BES3	$J/\psi \rightarrow \Lambda\overline{\Lambda}$

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

-0.763	± 0.011 ± 0.007	73k	ABLIKIM	22AD	BES3	$J/\psi \to \Xi\overline{\Xi} \to \Lambda\overline{\Lambda}\pi\pi$
-0.758	± 0.010 ± 0.007	420k	ABLIKIM	19BJ	BES3	$J/\psi \to \Lambda\overline{\Lambda}$
-0.755	± 0.083 ± 0.063	8.7k	ABLIKIM	10	BES	$J/\psi \to \Lambda\overline{\Lambda}$
-0.63	± 0.13	770	TIXIER	88	DM2	$J/\psi \to \Lambda\overline{\Lambda}$

$\overline{\alpha}_0$ FOR $\overline{\Lambda} \to \overline{n}\pi^0$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
-0.675 ± 0.011 OUR AVERAGE	Error includes scale factor of 1.2.				
$-0.668 \pm 0.008 ^{+0.006}_{-0.008}$	123k	ABLIKIM	24AR	BES3	$J/\psi \to \Xi\overline{\Xi} \to \Lambda\overline{\Lambda}\pi\pi$
$-0.692 \pm 0.016 \pm 0.006$	47k	ABLIKIM	19BJ	BES3	J/ψ to $\Lambda\overline{\Lambda}$

α_0 FOR $\Lambda \to n\pi^0$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
$0.670 \pm 0.009 ^{+0.009}_{-0.008}$	144k	ABLIKIM	24AR	BES3	$J/\psi \to \Xi\overline{\Xi} \to \Lambda\overline{\Lambda}\pi\pi$

α_γ FOR $\Lambda \to n\gamma$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
$-0.16 \pm 0.10 \pm 0.05$	13889	ABLIKIM	22AJ	BES3	$J/\psi \to \Lambda\overline{\Lambda}$

ϕ ANGLE FOR $\Lambda \to p\pi^-$ ($\tan\phi = \beta / \gamma$)

VALUE (°)	EVTS	DOCUMENT ID		TECN	COMMENT
-6.5 ± 3.5 OUR AVERAGE					
-7.0 ± 4.5	10325	CLELAND	72	OSPK	Λ from $\pi^- p$
-8.0 ± 6.0	10130	OVERSETH	67	OSPK	Λ from $\pi^- p$
13.0 ± 17.0	1156	CRONIN	63	OSPK	Λ from $\pi^- p$

$\alpha_0 / \alpha_- = \alpha(\Lambda \to n\pi^0) / \alpha(\Lambda \to p\pi^-)$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
$0.888 ^{+0.034}_{-0.030}$ OUR AVERAGE	Error includes scale factor of 1.7.				
$0.877 \pm 0.015 ^{+0.014}_{-0.010}$	144k	ABLIKIM	24AR	BES3	$J/\psi \to \Xi\overline{\Xi} \to \Lambda\overline{\Lambda}\pi\pi$
1.000 ± 0.068	4760	[1] OLSEN	70	OSPK	$\pi^+ n \to \Lambda K^+$
1.10 ± 0.27		CORK	60	CNTR	

[1] OLSEN 70 compares proton and neutron distributions from Λ decay.

$\overline{\alpha}_0 / \alpha_+$ in $\overline{\Lambda} \to \overline{n}\pi^0$, $\overline{\Lambda} \to \overline{p}\pi^+$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
$0.876 ^{+0.022}_{-0.020}$ OUR AVERAGE	Error includes scale factor of 1.4.				
$0.863 \pm 0.014 ^{+0.012}_{-0.008}$	123k	ABLIKIM	24AR	BES3	$J/\psi \to \Xi\overline{\Xi} \to \Lambda\overline{\Lambda}\pi\pi$
$0.913 \pm 0.028 \pm 0.012$	47k	ABLIKIM	19BJ	BES3	J/ψ to $\Lambda\overline{\Lambda}$

$(\alpha_- + \alpha_+)/(\alpha_- - \alpha_+)$ in $\Lambda \to p\pi^-$, $\overline{\Lambda} \to \overline{p}\pi^+$

Zero if CP is conserved; α_- and α_+ are the asymmetry parameters for $\Lambda \to p\pi^-$ and $\overline{\Lambda} \to \overline{p}\pi^+$ decay. See also the Ξ^- for a similar test involving the decay chain $\Xi^- \to \Lambda\pi^-$, $\Lambda \to p\pi^-$ and the corresponding antiparticle chain.

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
−0.3 ± 0.4 OUR AVERAGE					
$-2.2 \pm 1.6 \pm 0.7$	27k	AAIJ	24AH	LHCB	$\Lambda_b \to \Lambda_c \to \Lambda h^+$
$-0.7 \pm 0.8\ ^{+0.2}_{-0.3}$	267k	ABLIKIM	24AR	BES3	$J/\psi \to \Xi\overline{\Xi} \to \Lambda\overline{\Lambda}\pi\pi$
$3.0 \pm 6.9 \pm 1.5$	1.1M	ABLIKIM	24CE	BES3	$J/\psi/\psi(2S) \to \Sigma\overline{\Sigma} \to \Lambda\overline{\Lambda}\gamma\gamma$
$1.3 \pm 0.7 \pm 1.1$	369k	[1] LI	23C	BELL	$J/\psi \to \Xi\overline{\Xi} \to \Lambda\overline{\Lambda}\pi\pi$
$-0.25 \pm 0.46 \pm 0.12$	3.2M	ABLIKIM	22AG	BES3	$J/\psi \to \Lambda\overline{\Lambda}$
$-8.1 \pm 5.5 \pm 5.9$	8.7k	ABLIKIM	10	BES	$J/\psi \to \Lambda\overline{\Lambda}$
1.3 ± 2.2	96k	BARNES	96	CNTR	LEAR $\overline{p}p \to \overline{\Lambda}\Lambda$
1 ± 10	770	TIXIER	88	DM2	$J/\psi \to \Lambda\overline{\Lambda}$
-2 ± 14	10k	[2] CHAUVAT	85	CNTR	pp, $\overline{p}p$ ISR
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$-0.4 \pm 1.2 \pm 0.9$	73k	ABLIKIM	22AD	BES3	$J/\psi \to \Xi\overline{\Xi} \to \Lambda\overline{\Lambda}\pi\pi$
$-0.6 \pm 1.2 \pm 0.7$	420k	[3] ABLIKIM	19BJ	BES3	$J/\psi \to \Lambda\overline{\Lambda}$
-7 ± 9	4063	BARNES	87	CNTR	See BARNES 96

[1] LI 23C quote the average Λ-hyperon asymmetry A^{α}_{CP} from 264k $\Lambda_c^+ \to \Lambda\pi^+$ decays and 105k $\Lambda_c^+ \to \Sigma^0\pi^+$ decays, under the assumption of no CP violation in the SM for Λ_c^+, i.e. $\alpha_{\Lambda_c^+} = -\alpha_{\overline{\Lambda}_c^-}$.

[2] CHAUVAT 85 actually gives $\alpha_+(\overline{\Lambda})/\alpha_-(\Lambda) = -1.04 \pm 0.29$. Assumes polarization is same in $\overline{p}p \to \overline{\Lambda}X$ and $pp \to \Lambda X$. Tests of this assumption, based on C-invariance and fragmentation, are satisfied by the data.

[3] Superseded by ABLIKIM 22AG.

$(\alpha_0 + \overline{\alpha}_0)/(\alpha_0 - \overline{\alpha}_0)$ in $\Lambda \to n\pi^0$, $\overline{\Lambda} \to \overline{n}\pi^0$

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
$\mathbf{0.1 \pm 0.9\ ^{+0.5}_{-0.7}}$	267k	ABLIKIM	24AR	BES3	$J/\psi \to \Xi\overline{\Xi} \to \Lambda\overline{\Lambda}\pi\pi$

$R = |G_E/G_M|$ in $\Lambda \to p\pi^-$, $\overline{\Lambda} \to \overline{p}\pi^+$

VALUE	DOCUMENT ID		TECN	COMMENT
0.96±0.14±0.02	[1] ABLIKIM	19BF	BES3	$e^+e^- \to \overline{\Lambda}\Lambda$ at $\sqrt{s} =$ 2.396 GeV

[1] Determined using the latest BES-III value on the asymmetry parameter $\alpha = 0.750 \pm 0.010$.

$\Delta\Phi = \Phi_E - \Phi_M$ in $\Lambda \to p\pi^-$, $\overline{\Lambda} \to \overline{p}\pi^+$

VALUE (degrees)	DOCUMENT ID		TECN	COMMENT
37±12±6	[1] ABLIKIM	19BF	BES3	$e^+e^- \to \overline{\Lambda}\Lambda$ at $\sqrt{s} =$ 2.396 GeV

[1] Relative phase between GE and GM, determined using the latest BES-III value on the asymmetry parameter $\alpha = 0.750 \pm 0.010$.

g_A / g_V FOR $\Lambda \to p e^- \overline{\nu}_e$

Measurements with fewer than 500 events have been omitted. Where necessary, signs have been changed to agree with our conventions, which are given in the "Note on Baryon Decay Parameters" in the neutron Listings. The measurements all assume that the form factor $g_2 = 0$. See also the footnote on DWORKIN 90.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
−0.718±0.015 OUR AVERAGE					
−0.719±0.016±0.012	37k	[1] DWORKIN	90	SPEC	$e\nu$ angular corr.
−0.70 ±0.03	7111	BOURQUIN	83	SPEC	$\Xi \to \Lambda \pi^-$
−0.734±0.031	10k	[2] WISE	81	SPEC	$e\nu$ angular correl.
• • • We do not use the following data for averages, fits, limits, etc. • • •					
−0.63 ±0.06	817	ALTHOFF	73	OSPK	Polarized Λ

[1] The tabulated result assumes the weak-magnetism coupling $w \equiv g_W(0)/g_V(0)$ to be 0.97, as given by the CVC hypothesis and as assumed by the other listed measurements. However, DWORKIN 90 *measures* w to be 0.15 ± 0.30, and then $g_A/g_V = -0.731 \pm 0.016$.

[2] This experiment measures only the absolute value of g_A/g_V.

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