

$\Lambda(2085) \ 7/2^+$

$I(J^P) = 0(\frac{7}{2}^+)$ Status: **

OMITTED FROM SUMMARY TABLE
was $\Lambda(2020)$

In LITCHFIELD 71, need for the state rests solely on a possibly inconsistent polarization measurement at 1.784 GeV/c. HEMINGWAY 75 does not require this state. GOPAL 77 does not need it in either $N\bar{K}$ or $\Sigma\pi$. With new K^-n angular distributions included, DECLAIS 77 sees it. However, this and other new data are included in GOPAL 80 and the state is not required. BACCARI 77 weakly supports it.

$\Lambda(2085)$ POLE POSITION

REAL PART

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
1757	¹ KAMANO	15	DPWA Multichannel
¹ From the preferred solution A in KAMANO 15. Solution B reports $M = 2041^{+80}_{-82}$ MeV.			

–2×IMAGINARY PART

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
146	¹ KAMANO	15	DPWA Multichannel
¹ From the preferred solution A in KAMANO 15. Solution B reports $M = 238^{+114}_{-34}$ MeV.			

$\Lambda(2085)$ POLE RESIDUES

The normalized residue is the residue divided by $\Gamma_{pole}/2$.

Normalized residue in $N\bar{K} \rightarrow \Lambda(2085) \rightarrow N\bar{K}$

MODULUS	PHASE (°)	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.000145	–77	¹ KAMANO	15	DPWA Multichannel
¹ From the preferred solution A in KAMANO 15.				

Normalized residue in $N\bar{K} \rightarrow \Lambda(2085) \rightarrow \Sigma\pi$

MODULUS	PHASE (°)	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.0112	120	¹ KAMANO	15	DPWA Multichannel
¹ From the preferred solution A in KAMANO 15.				

Normalized residue in $N\bar{K} \rightarrow \Lambda(2085) \rightarrow \Lambda\eta$

MODULUS	PHASE (°)	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.000786	–100	¹ KAMANO	15	DPWA Multichannel
¹ From the preferred solution A in KAMANO 15.				

Normalized residue in $N\bar{K} \rightarrow \Lambda(2085) \rightarrow \Sigma(1385)\pi$, *F-wave*

MODULUS	PHASE (°)	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.00451	− 82	¹ KAMANO	15	DPWA Multichannel
¹ From the preferred solution A in KAMANO 15.				

Normalized residue in $N\bar{K} \rightarrow \Lambda(2085) \rightarrow \Sigma(1385)\pi$, *H-wave*

MODULUS	PHASE (°)	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.0000298	− 128	¹ KAMANO	15	DPWA Multichannel
¹ From the preferred solution A in KAMANO 15.				

$\Lambda(2085)$ MASS

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
≈ 2020 OUR ESTIMATE			
2043±22	ZHANG	13A	DPWA Multichannel
2140	BACCARI	77	DPWA $K^-p \rightarrow \Lambda\omega$
2117	DECLAIS	77	DPWA $\bar{K}N \rightarrow \bar{K}N$
2100±30	LITCHFIELD	71	DPWA $K^-p \rightarrow \bar{K}N$
2020±20	BARBARO-...	70	DPWA $K^-p \rightarrow \Sigma\pi$

$\Lambda(2085)$ WIDTH

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
200±75	ZHANG	13A	DPWA Multichannel
128	BACCARI	77	DPWA $K^-p \rightarrow \Lambda\omega$
167	DECLAIS	77	DPWA $\bar{K}N \rightarrow \bar{K}N$
120±30	LITCHFIELD	71	DPWA $K^-p \rightarrow \bar{K}N$
160±30	BARBARO-...	70	DPWA $K^-p \rightarrow \Sigma\pi$

$\Lambda(2085)$ DECAY MODES

Mode	Fraction (Γ_i/Γ)
Γ_1 $N\bar{K}$	
Γ_2 $\Sigma\pi$	
Γ_3 $\Lambda\eta$	
Γ_4 $\Sigma(1385)\pi$, <i>F-wave</i>	
Γ_5 $\Sigma(1385)\pi$, <i>H-wave</i>	
Γ_6 $N\bar{K}^*(892)$, $S=1/2$	(30±9) %
Γ_7 $N\bar{K}^*(892)$, $S=1/2$, <i>F-wave</i>	
Γ_8 $N\bar{K}^*(892)$, $S=3/2$, <i>F-wave</i>	
Γ_9 $N\bar{K}^*(892)$, $S=3/2$, <i>H-wave</i>	
Γ_{10} $\Lambda\omega$	

$\Lambda(2085)$ BRANCHING RATIOS

See “Sign conventions for resonance couplings” in the Note on Λ and Σ Resonances.

 $\Gamma(N\bar{K})/\Gamma_{\text{total}}$ **Γ_1/Γ**

VALUE	DOCUMENT ID	TECN	COMMENT
0.028 ± 0.005	ZHANG	13A	DPWA Multichannel
0.05	DECLAIS	77	DPWA $\bar{K}N \rightarrow \bar{K}N$
0.05 ± 0.02	LITCHFIELD	71	DPWA $K^- p \rightarrow \bar{K}N$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
not seen	¹ KAMANO	15	DPWA Multichannel

¹From the preferred solution A in KAMANO 15.

 $\Gamma(\Sigma\pi)/\Gamma_{\text{total}}$ **Γ_2/Γ**

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.891	¹ KAMANO	15	DPWA Multichannel

¹From the preferred solution A in KAMANO 15.

 $\Gamma(\Lambda\eta)/\Gamma_{\text{total}}$ **Γ_3/Γ**

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.002	¹ KAMANO	15	DPWA Multichannel

¹From the preferred solution A in KAMANO 15.

 $\Gamma(\Sigma(1385)\pi, F\text{-wave})/\Gamma_{\text{total}}$ **Γ_4/Γ**

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.105	¹ KAMANO	15	DPWA Multichannel

¹From the preferred solution A in KAMANO 15.

 $\Gamma(\Sigma(1385)\pi, H\text{-wave})/\Gamma_{\text{total}}$ **Γ_5/Γ**

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
not seen	¹ KAMANO	15	DPWA Multichannel

¹From the preferred solution A in KAMANO 15.

 $\Gamma(N\bar{K}^*(892), S=1/2, F\text{-wave})/\Gamma_{\text{total}}$ **Γ_7/Γ**

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
not seen	¹ KAMANO	15	DPWA Multichannel

¹From the preferred solution A in KAMANO 15.

 $\Gamma(N\bar{K}^*(892), S=3/2, F\text{-wave})/\Gamma_{\text{total}}$ **Γ_8/Γ**

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.001	¹ KAMANO	15	DPWA Multichannel

¹From the preferred solution A in KAMANO 15.

$\Gamma(N\bar{K}^*(892), S=3/2, H\text{-wave})/\Gamma_{\text{total}}$
 Γ_9/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

not seen ¹ KAMANO 15 DPWA Multichannel

¹ From the preferred solution A in KAMANO 15.

 $\Gamma(N\bar{K}^*(892), S=1/2)/\Gamma_{\text{total}}$
 Γ_6/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
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0.30±0.09 ZHANG 13A DPWA Multichannel

 $(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{\text{total}}$ in $N\bar{K} \rightarrow \Lambda(2085) \rightarrow \Sigma\pi$
 $(\Gamma_1\Gamma_2)^{1/2}/\Gamma$

VALUE	DOCUMENT ID	TECN	COMMENT
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+0.02±0.01 ZHANG 13A DPWA Multichannel

−0.15±0.02 BARBARO-... 70 DPWA $K^-p \rightarrow \Sigma\pi$

 $(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{\text{total}}$ in $N\bar{K} \rightarrow \Lambda(2085) \rightarrow \Lambda\omega$
 $(\Gamma_1\Gamma_{10})^{1/2}/\Gamma$

VALUE	DOCUMENT ID	TECN	COMMENT
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<0.05 BACCARI 77 DPWA $K^-p \rightarrow \Lambda\omega$

$\Lambda(2085)$ REFERENCES

KAMANO	15	PR C92 025205	H. Kamano <i>et al.</i>	(ANL, OSAK)
ZHANG	13A	PR C88 035205	H. Zhang <i>et al.</i>	(KSU)
GOPAL	80	Toronto Conf. 159	G.P. Gopal	(RHEL)
BACCARI	77	NC 41A 96	B. Baccari <i>et al.</i>	(SACL, CDEF) IJP
DECLAIS	77	CERN 77-16	Y. Declais <i>et al.</i>	(CAEN, CERN) IJP
GOPAL	77	NP B119 362	G.P. Gopal <i>et al.</i>	(LOIC, RHEL)
HEMINGWAY	75	NP B91 12	R.J. Hemingway <i>et al.</i>	(CERN, HEIDH, MPIM) IJP
LITCHFIELD	71	NP B30 125	P.J. Litchfield <i>et al.</i>	(RHEL, CDEF, SACL) IJP
BARBARO-...	70	Duke Conf. 173	A. Barbaro-Galtieri	(LRL) IJP
Hyperon Resonances, 1970				