

$\Lambda(2085) \ 7/2^+$ $I(J^P) = 0(\frac{7}{2}^+)$ 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

<u>MODULUS</u>	<u>PHASE ($^\circ$)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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• • • We do not use the following data for averages, fits, limits, etc. • • •

0.00451	-82	¹ KAMANO	15	DPWA Multichannel
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¹From the preferred solution A in KAMANO 15.**Normalized residue in $N\bar{K} \rightarrow \Lambda(2085) \rightarrow \Sigma(1385)\pi$, *H*-wave**

<u>MODULUS</u>	<u>PHASE ($^\circ$)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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• • • We do not use the following data for averages, fits, limits, etc. • • •

0.0000298	-128	¹ KAMANO	15	DPWA Multichannel
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¹From the preferred solution A in KAMANO 15. **$\Lambda(2085)$ MASS**

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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 \approx 2020 OUR ESTIMATE

2043 \pm 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 \pm 30	LITCHFIELD	71	DPWA $K^- p \rightarrow \bar{K}N$
2020 \pm 20	BARBARO-...	70	DPWA $K^- p \rightarrow \Sigma\pi$

 $\Lambda(2085)$ WIDTH

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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200 \pm 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 \pm 30	LITCHFIELD	71	DPWA $K^- p \rightarrow \bar{K}N$
160 \pm 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</i> -wave	
Γ_5 $\Sigma(1385)\pi$, <i>H</i> -wave	
Γ_6 $N\bar{K}^*(892)$, $S=1/2$, <i>F</i> -wave	
Γ_7 $N\bar{K}^*(892)$, $S=3/2$, <i>F</i> -wave	
Γ_8 $N\bar{K}^*(892)$, $S=3/2$, <i>H</i> -wave	
Γ_9 $\Lambda\omega$	
Γ_{10} $N\bar{K}^*(892)$, $S=1/2$	(30 \pm 9) %

$\Lambda(2085)$ 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

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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 $K^- p \rightarrow \bar{K}N$
not seen	¹ KAMANO	15	DPWA Multichannel

¹From the preferred solution A in KAMANO 15.

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

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.891	¹ KAMANO	15	DPWA Multichannel

¹From the preferred solution A in KAMANO 15.

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

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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_6/Γ

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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_7/Γ

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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_8/Γ

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

not seen ¹KAMANO 15 DPWA Multichannel¹From the preferred solution A in KAMANO 15. $\Gamma(N\bar{K}^*(892), S=1/2)/\Gamma_{\text{total}}$ Γ_{10}/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 $N\bar{K} \rightarrow \Lambda(2085) \rightarrow \Lambda\omega$ $(\Gamma_1\Gamma_9)^{1/2}/\Gamma$

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				