

$\Lambda(2000)$

$I(J^P) = 0(?^?)$ Status: *

OMITTED FROM SUMMARY TABLE

We list here all the ambiguous resonance possibilities with a mass around 2 GeV. The proposed quantum numbers are D_3 (BARBARO-GALTIERI 70 in $\Sigma\pi$), D_3+F_5 , P_3+D_5 , or P_1+D_3 (BRANDSTETTER 72 in $\Lambda\omega$), and S_1 (CAMERON 78B in $N\bar{K}^*$). The first two of the above analyses should now be considered obsolete. See also NAKKASYAN 75.

$\Lambda(2000)$ MASS

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
≈ 2000 OUR ESTIMATE			
2030 \pm 30	CAMERON	78B	DPWA $K^- p \rightarrow N\bar{K}^*$
1935 to 1971	¹ BRANDSTET...72		DPWA $K^- p \rightarrow \Lambda\omega$
1951 to 2034	¹ BRANDSTET...72		DPWA $K^- p \rightarrow \Lambda\omega$
2010 \pm 30	BARBARO-...	70	DPWA $K^- p \rightarrow \Sigma\pi$

$\Lambda(2000)$ WIDTH

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
125 \pm 25	CAMERON	78B	DPWA $K^- p \rightarrow N\bar{K}^*$
180 to 240	¹ BRANDSTET...72		DPWA (lower mass)
73 to 154	¹ BRANDSTET...72		DPWA (higher mass)
130 \pm 50	BARBARO-...	70	DPWA $K^- p \rightarrow \Sigma\pi$

$\Lambda(2000)$ DECAY MODES

Mode
Γ_1 $N\bar{K}$
Γ_2 $\Sigma\pi$
Γ_3 $\Lambda\omega$
Γ_4 $N\bar{K}^*(892)$, $S=1/2$, S -wave
Γ_5 $N\bar{K}^*(892)$, $S=3/2$, D -wave

$\Lambda(2000)$ BRANCHING RATIOS

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

$(\Gamma_i \Gamma_f)^{1/2} / \Gamma_{\text{total}}$ in $N\bar{K} \rightarrow \Lambda(2000) \rightarrow \Sigma\pi$	DOCUMENT ID	TECN	COMMENT	$(\Gamma_1 \Gamma_2)^{1/2} / \Gamma$
VALUE				
-0.20 ± 0.04	BARBARO-...	70	DPWA $K^- p \rightarrow \Sigma\pi$	

$(\Gamma_i \Gamma_f)^{1/2} / \Gamma_{\text{total}}$ in $N\bar{K} \rightarrow \Lambda(2000) \rightarrow \Lambda\omega$	$(\Gamma_1 \Gamma_3)^{1/2} / \Gamma$		
VALUE	DOCUMENT ID	TECN	COMMENT
0.17 to 0.25	¹ BRANDSTET...72	DPWA	(lower mass)
0.04 to 0.15	¹ BRANDSTET...72	DPWA	(higher mass)

$(\Gamma_i \Gamma_f)^{1/2} / \Gamma_{\text{total}}$ in $N\bar{K} \rightarrow \Lambda(2000) \rightarrow N\bar{K}^*(892), S=1/2, S\text{-wave}$	$(\Gamma_1 \Gamma_4)^{1/2} / \Gamma$		
VALUE	DOCUMENT ID	TECN	COMMENT
-0.12 ± 0.03	² CAMERON	78B DPWA	$K^- p \rightarrow N\bar{K}^*$

$(\Gamma_i \Gamma_f)^{1/2} / \Gamma_{\text{total}}$ in $N\bar{K} \rightarrow \Lambda(2000) \rightarrow N\bar{K}^*(892), S=3/2, D\text{-wave}$	$(\Gamma_1 \Gamma_5)^{1/2} / \Gamma$		
VALUE	DOCUMENT ID	TECN	COMMENT
$+0.09 \pm 0.03$	CAMERON	78B DPWA	$K^- p \rightarrow N\bar{K}^*$

$\Lambda(2000)$ FOOTNOTES

¹ The parameters quoted here are ranges from the three best fits; the lower state probably has $J \leq 3/2$, and the higher one probably has $J \leq 5/2$.

² The published sign has been changed to be in accord with the baryon-first convention.

$\Lambda(2000)$ REFERENCES

CAMERON	78B	NP B146 327	+FraneK, Gopal, Kalmus, McPherson+	(RHEL, LOIC) IJP
NAKKASYAN	75	NP B93 85		(CERN) IJP
BRANDSTET...	72	NP B39 13	Brandstetter, Butterworth+	(RHEL, CDEF, SACL)
BARBARO-...	70	Duke Conf. 173	Barbaro-Galtieri	(LRL) IJP