$\Lambda(2000)$

$I(J^P) = 0(?^?)$ 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 $N\overline{K}^*$). 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 ± 30	CAMERON	78B	DPWA	$K^- p \rightarrow N\overline{K}^*$
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 ± 30	BARBARO-...	70	DPWA	$K^- p \rightarrow \Sigma\pi$

$\Lambda(2000)$ WIDTH

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

$\Lambda(2000)$ DECAY MODES

	Mode
Γ_1	$N\overline{K}$
Γ_2	$\Sigma\pi$
Γ_3	$\Lambda\omega$
Γ_4	$N\overline{K}^*(892)$, S=1/2, S-wave
Γ_5	$N\overline{K}^*(892)$, 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 $N\overline{K} \rightarrow \Lambda(2000) \rightarrow \Sigma\pi$ $\quad(\Gamma_1\Gamma_2)^{1/2}/\Gamma$

VALUE	DOCUMENT ID		TECN	COMMENT
-0.20 ± 0.04	BARBARO-...	70	DPWA	$K^- p \rightarrow \Sigma\pi$

$(\Gamma_i \Gamma_f)^{1/2}/\Gamma_{total}$ in $N\overline{K} \to \Lambda(2000) \to \Lambda\omega$ — $(\Gamma_1 \Gamma_3)^{1/2}/\Gamma$

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)

$(\Gamma_i \Gamma_f)^{1/2}/\Gamma_{total}$ in $N\overline{K} \to \Lambda(2000) \to N\overline{K}^*(892)$, S=1/2, S-wave — $(\Gamma_1 \Gamma_4)^{1/2}/\Gamma$

VALUE	*DOCUMENT ID*	*TECN*	*COMMENT*
-0.12 ± 0.03	[2] CAMERON 78B	DPWA	$K^- p \to N\overline{K}^*$

$(\Gamma_i \Gamma_f)^{1/2}/\Gamma_{total}$ in $N\overline{K} \to \Lambda(2000) \to N\overline{K}^*(892)$, S=3/2, D-wave — $(\Gamma_1 \Gamma_5)^{1/2}/\Gamma$

VALUE	*DOCUMENT ID*	*TECN*	*COMMENT*
$+0.09 \pm 0.03$	CAMERON 78B	DPWA	$K^- p \to N\overline{K}^*$

Λ(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.

Λ(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