$\Lambda(2000)$

$I(J^P) = 0(?^?)$ 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	$K^- p \to N\overline{K}^*$
1935 to 1971	[1]	BRANDSTET...	72	DPWA	$K^- p \to \Lambda\omega$
1951 to 2034	[1]	BRANDSTET...	72	DPWA	$K^- p \to \Lambda\omega$
2010±30		BARBARO-...	70	DPWA	$K^- p \to \Sigma\pi$

$\Lambda(2000)$ WIDTH

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

$\Lambda(2000)$ 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.

$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{total}$ in $N\overline{K} \to \Lambda(2000) \to \Sigma\pi$ $(\Gamma_1\Gamma_2)^{1/2}/\Gamma$

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

$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{total}$ 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
$+0.09\pm0.03$	CAMERON 78B	DPWA	$K^- p \to N\overline{K}^*$

$\Lambda(2000)$ 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 W. Cameron *et al.* (RHEL, LOIC) IJP
NAKKASYAN 75 NP B93 85 A. Nakkasyan (CERN) IJP
BRANDSTET... 72 NP B39 13 A.A. Brandstetter *et al.* (RHEL, CDEF+)
BARBARO-... 70 Duke Conf. 173 A. Barbaro-Galtieri (LRL) IJP
Hyperon Resonances, 1970