

$\Lambda(2350) \ H_{09}$

$I(J^P) = 0(\frac{9}{2}^+)$ Status: ***

DAUM 68 favors $J^P = 7/2^-$ or $9/2^+$. BRICMAN 70 favors $9/2^+$. LASINSKI 71 suggests three states in this region using a Pomeron + resonances model. There are now also three formation experiments from the College de France-Saclay group, DEBELLEFON 77, BACCARI 77, and DEBELLEFON 78, which find $9/2^+$ in energy-dependent partial-wave analyses of $\overline{K}N \rightarrow \Sigma\pi$, $\Lambda\omega$, and $N\overline{K}$.

$\Lambda(2350)$ MASS

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
2340 to 2370 (≈ 2350) OUR ESTIMATE			
2370 $\pm$ 50	DEBELLEFON 78	DPWA	$\overline{K}N \rightarrow \overline{K}N$
2365 $\pm$ 20	DEBELLEFON 77	DPWA	$K^-p \rightarrow \Sigma\pi$
2358 $\pm$ 6	BRICMAN 70	CNTR	Total, charge exchange
• • • We do not use the following data for averages, fits, limits, etc. • • •			
2372	BACCARI 77	DPWA	$K^-p \rightarrow \Lambda\omega$
2344 $\pm$ 15	COOL 70	CNTR	K^-p, K^-d total
2360 $\pm$ 20	LU 70	CNTR	$\gamma p \rightarrow K^+Y^*$
2340 $\pm$ 7	BUGG 68	CNTR	K^-p, K^-d total

$\Lambda(2350)$ WIDTH

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
100 to 250 (≈ 150) OUR ESTIMATE			
204 $\pm$ 50	DEBELLEFON 78	DPWA	$\overline{K}N \rightarrow \overline{K}N$
110 $\pm$ 20	DEBELLEFON 77	DPWA	$K^-p \rightarrow \Sigma\pi$
324 $\pm$ 30	BRICMAN 70	CNTR	Total, charge exchange
• • • We do not use the following data for averages, fits, limits, etc. • • •			
257	BACCARI 77	DPWA	$K^-p \rightarrow \Lambda\omega$
190	COOL 70	CNTR	K^-p, K^-d total
55	LU 70	CNTR	$\gamma p \rightarrow K^+Y^*$
140 $\pm$ 20	BUGG 68	CNTR	K^-p, K^-d total

$\Lambda(2350)$ DECAY MODES

Mode	Fraction (Γ_i/Γ)
$\Gamma_1 \ N\overline{K}$	$\sim 12\%$
$\Gamma_2 \ \Sigma\pi$	$\sim 10\%$
$\Gamma_3 \ \Lambda\omega$	

The above branching fractions are our estimates, not fits or averages.

$\Lambda(2350)$ 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	
~ 0.12 OUR ESTIMATE				
0.12 ± 0.04	DEBELLEFON 78	DPWA	$\bar{K}N \rightarrow \bar{K}N$	
$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{\text{total}}$ in $N\bar{K} \rightarrow \Lambda(2350) \rightarrow \Sigma\pi$				$(\Gamma_1\Gamma_2)^{1/2}/\Gamma$
VALUE	DOCUMENT ID	TECN	COMMENT	
-0.11 ± 0.02	DEBELLEFON 77	DPWA	$K^-p \rightarrow \Sigma\pi$	
$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{\text{total}}$ in $N\bar{K} \rightarrow \Lambda(2350) \rightarrow \Lambda\omega$				$(\Gamma_1\Gamma_3)^{1/2}/\Gamma$
VALUE	DOCUMENT ID	TECN	COMMENT	
<0.05	BACCARI 77	DPWA	$K^-p \rightarrow \Lambda\omega$	

$\Lambda(2350)$ REFERENCES

DEBELLEFON 78	NC 42A 403	A. de Bellefon <i>et al.</i>	(CDEF, SACL) IJP
BACCARI 77	NC 41A 96	B. Baccari <i>et al.</i>	(SACL, CDEF) IJP
DEBELLEFON 77	NC 37A 175	A. de Bellefon <i>et al.</i>	(CDEF, SACL) IJP
LASINSKI 71	NP B29 125	T.A. Lasinski	(EFI) IJP
BRICMAN 70	PL 31B 152	C. Bricman <i>et al.</i>	(CERN, CAEN, SACL)
COOL 70	PR D1 1887	R.L. Cool <i>et al.</i>	(BNL) I
Also 66	PRL 16 1228	R.L. Cool <i>et al.</i>	(BNL) I
LU 70	PR D2 1846	D.C. Lu <i>et al.</i>	(YALE)
BUGG 68	PR 168 1466	D.V. Bugg <i>et al.</i>	(RHEL, BIRM, CAVE) I
DAUM 68	NP B7 19	C. Daum <i>et al.</i>	(CERN) JP