

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

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

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  $\bar{K}N \rightarrow \Sigma\pi$ ,  $\Lambda\omega$ , and  $N\bar{K}$ .

## $\Lambda(2350)$ MASS

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
<b>2340 to 2370 (<math>\approx 2350</math>) OUR ESTIMATE</b>			
2370 $\pm$ 50	DEBELLEFON 78	DPWA	$\bar{K}N \rightarrow \bar{K}N$
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
<b>100 to 250 (<math>\approx 150</math>) OUR ESTIMATE</b>			
204 $\pm$ 50	DEBELLEFON 78	DPWA	$\bar{K}N \rightarrow \bar{K}N$
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 ( $\Gamma_i/\Gamma$ )
$\Gamma_1 \quad N\bar{K}$	$\sim 12\%$
$\Gamma_2 \quad \Sigma\pi$	$\sim 10\%$
$\Gamma_3 \quad \Lambda\omega$	

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  $\Lambda$  and  $\Sigma$  Resonances.

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