

$\Lambda(2020) 7/2^+$  $I(J^P) = 0(\frac{7}{2}^+)$  Status: \*

## OMITTED FROM SUMMARY TABLE

In LITCHFIELD 71, need for the state rests solely on a possibly inconsistent polarization measurement at 1.784 GeV/c. HEMINGWAY 75 does not require this state. GOPAL 77 does not need it in either  $N\bar{K}$  or  $\Sigma\pi$ . With new  $K^-n$  angular distributions included, DECLAIS 77 sees it. However, this and other new data are included in GOPAL 80 and the state is not required. BACCARI 77 weakly supports it.

 $\Lambda(2020)$  MASS

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
$\approx 2020$ OUR ESTIMATE			
$2043 \pm 22$	ZHANG	13A	DPWA Multichannel
2140	BACCARI	77	DPWA $K^-p \rightarrow \Lambda\omega$
2117	DECLAIS	77	DPWA $\bar{K}N \rightarrow \bar{K}N$
$2100 \pm 30$	LITCHFIELD	71	DPWA $K^-p \rightarrow \bar{K}N$
$2020 \pm 20$	BARBARO-...	70	DPWA $K^-p \rightarrow \Sigma\pi$

 $\Lambda(2020)$  WIDTH

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
$200 \pm 75$	ZHANG	13A	DPWA Multichannel
128	BACCARI	77	DPWA $K^-p \rightarrow \Lambda\omega$
167	DECLAIS	77	DPWA $\bar{K}N \rightarrow \bar{K}N$
$120 \pm 30$	LITCHFIELD	71	DPWA $K^-p \rightarrow \bar{K}N$
$160 \pm 30$	BARBARO-...	70	DPWA $K^-p \rightarrow \Sigma\pi$

 $\Lambda(2020)$  DECAY MODES

Mode	Fraction ( $\Gamma_i/\Gamma$ )
$\Gamma_1$ $N\bar{K}$	
$\Gamma_2$ $\Sigma\pi$	
$\Gamma_3$ $\Lambda\omega$	
$\Gamma_4$ $N\bar{K}^*(892)$ , S=1/2	(30±9) %

 $\Lambda(2020)$  BRANCHING RATIOS

See "Sign conventions for resonance couplings" in the Note on  $\Lambda$  and  $\Sigma$  Resonances.

$\Gamma(N\bar{K})/\Gamma_{\text{total}}$	DOCUMENT ID	TECN	COMMENT	$\Gamma_1/\Gamma$
$0.028 \pm 0.005$	ZHANG	13A	DPWA Multichannel	
0.05	DECLAIS	77	DPWA $\bar{K}N \rightarrow \bar{K}N$	
$0.05 \pm 0.02$	LITCHFIELD	71	DPWA $K^-p \rightarrow \bar{K}N$	

$(\Gamma_i \Gamma_f)^{1/2} / \Gamma_{\text{total}}$ in $N\bar{K} \rightarrow \Lambda(2020) \rightarrow \Sigma \pi$				$(\Gamma_1 \Gamma_2)^{1/2} / \Gamma$
VALUE	DOCUMENT ID	TECN	COMMENT	
+0.02±0.01	ZHANG	13A	DPWA	Multichannel
-0.15±0.02	BARBARO-...	70	DPWA	$K^- p \rightarrow \Sigma \pi$

  

$(\Gamma_i \Gamma_f)^{1/2} / \Gamma_{\text{total}}$ in $N\bar{K} \rightarrow \Lambda(2020) \rightarrow \Lambda \omega$				$(\Gamma_1 \Gamma_3)^{1/2} / \Gamma$
VALUE	DOCUMENT ID	TECN	COMMENT	
<0.05	BACCARI	77	DPWA	$K^- p \rightarrow \Lambda \omega$

  

$\Gamma(N\bar{K}^*(892), S=1/2) / \Gamma_{\text{total}}$				$\Gamma_4 / \Gamma$
VALUE	DOCUMENT ID	TECN	COMMENT	
<b>0.30±0.09</b>	ZHANG	13A	DPWA	Multichannel

### $\Lambda(2020)$ REFERENCES

ZHANG	13A	PR C88 035205	H. Zhang <i>et al.</i>	(KSU)
GOPAL	80	Toronto Conf. 159	G.P. Gopal	(RHEL)
BACCARI	77	NC 41A 96	B. Baccari <i>et al.</i>	(SACL, CDEF) IJP
DECLAIS	77	CERN 77-16	Y. Declais <i>et al.</i>	(CAEN, CERN) IJP
GOPAL	77	NP B119 362	G.P. Gopal <i>et al.</i>	(LOIC, RHEL)
HEMINGWAY	75	NP B91 12	R.J. Hemingway <i>et al.</i>	(CERN, HEIDH, MPIM) IJP
LITCHFIELD	71	NP B30 125	P.J. Litchfield <i>et al.</i>	(RHEL, CDEF, SACL) IJP
BARBARO-...	70	Duke Conf. 173	A. Barbaro-Galtieri	(LRL) IJP
Hyperon Resonances, 1970				