

# $\Sigma(1620) S_{11}$

$$I(J^P) = 1(\frac{1}{2}^-) \text{ Status: } **$$

## OMITTED FROM SUMMARY TABLE

The  $S_{11}$  state at 1697 MeV reported by VANHORN 75 is tentatively listed under the  $\Sigma(1750)$ . CARROLL 76 sees two bumps in the isospin-1 total cross section near this mass.

Production experiments are listed separately in the next entry.

### $\Sigma(1620)$ MASS

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>\approx 1620</math> OUR ESTIMATE</b>			
$1600 \pm 6$	1 MORRIS	78	DPWA $K^- n \rightarrow \Lambda \pi^-$
$1608 \pm 5$	2 CARROLL	76	DPWA Isospin-1 total $\sigma$
$1633 \pm 10$	3 CARROLL	76	DPWA Isospin-1 total $\sigma$
$1630 \pm 10$	LANGBEIN	72	IPWA $\bar{K} N$ multichannel
1620	KIM	71	DPWA K-matrix analysis

### $\Sigma(1620)$ WIDTH

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$87 \pm 19$	1 MORRIS	78	DPWA $K^- n \rightarrow \Lambda \pi^-$
15	2 CARROLL	76	DPWA Isospin-1 total $\sigma$
10	3 CARROLL	76	DPWA Isospin-1 total $\sigma$
$65 \pm 20$	LANGBEIN	72	IPWA $\bar{K} N$ multichannel
40	KIM	71	DPWA K-matrix analysis

### $\Sigma(1620)$ DECAY MODES

Mode
$\Gamma_1 \quad N\bar{K}$
$\Gamma_2 \quad \Lambda\pi$
$\Gamma_3 \quad \Sigma\pi$

### $\Sigma(1620)$ BRANCHING RATIOS

<u><math>\Gamma(N\bar{K})/\Gamma_{\text{total}}</math></u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	<u><math>\Gamma_1/\Gamma</math></u>
$0.22 \pm 0.02$	LANGBEIN	72	IPWA $\bar{K} N$ multichannel	
0.05	KIM	71	DPWA K-matrix analysis	
<u><math>(\Gamma_i \Gamma_f)^{1/2}/\Gamma_{\text{total}}</math> in <math>N\bar{K} \rightarrow \Sigma(1620) \rightarrow \Lambda\pi</math></u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	<u><math>(\Gamma_1 \Gamma_2)^{1/2}/\Gamma</math></u>
$0.12 \pm 0.02$	1 MORRIS	78	DPWA $K^- n \rightarrow \Lambda \pi^-$	
not seen	BAILLON	75	IPWA $\bar{K} N \rightarrow \Lambda \pi$	
0.15	KIM	71	DPWA K-matrix analysis	

$(\Gamma_i \Gamma_f)^{1/2} / \Gamma_{\text{total}}$ in $N\bar{K} \rightarrow \Sigma(1620) \rightarrow \Sigma\pi$				$(\Gamma_1 \Gamma_3)^{1/2} / \Gamma$
VALUE	DOCUMENT ID	TECN	COMMENT	
not seen	HEPP	76B	DPWA	$K^- N \rightarrow \Sigma\pi$
$0.40 \pm 0.06$	LANGBEIN	72	IPWA	$\bar{K} N$ multichannel
0.08	KIM	71	DPWA	K-matrix analysis

### $\Sigma(1620)$ FOOTNOTES

<sup>1</sup> MORRIS 78 obtains an equally good fit without including this resonance.

<sup>2</sup> Total cross-section bump with  $(J+1/2) \Gamma_{\text{el}} / \Gamma_{\text{total}}$  is 0.06 seen by CARROLL 76.

<sup>3</sup> Total cross-section bump with  $(J+1/2) \Gamma_{\text{el}} / \Gamma_{\text{total}}$  is 0.04 seen by CARROLL 76.

### $\Sigma(1620)$ REFERENCES

MORRIS	78	PR D17 55	W.A. Morris <i>et al.</i>	(FSU) IJP
CARROLL	76	PRL 37 806	A.S. Carroll <i>et al.</i>	(BNL) I
HEPP	76B	PL 65B 487	V. Hepp <i>et al.</i>	(CERN, HEIDH, MPIM) IJP
BAILLON	75	NP B94 39	P.H. Baillon, P.J. Litchfield	(CERN, RHEL) IJP
VANHORN	75	NP B87 145	A.J. van Horn	(LBL) IJP
Also		NP B87 157	A.J. van Horn	(LBL) IJP
LANGBEIN	72	NP B47 477	W. Langbein, F. Wagner	(MPIM) IJP
KIM	71	PRL 27 356	J.K. Kim	(HARV) IJP
Also		Duke Conf. 161	J.K. Kim	(HARV) IJP
Hyperon Resonances, 1970				