

Σ(1560) Bumps

$$I(J^P) = 1(?^?) \quad \text{Status: } **$$

OMITTED FROM SUMMARY TABLE

This entry lists peaks reported in mass spectra around 1560 MeV without implying that they are necessarily related.

DIONISI 78B observes a 6 standard-deviation enhancement at 1553 MeV in the charged $\Lambda/\Sigma\pi$ mass spectra from $K^-p \rightarrow (\Lambda/\Sigma)\pi K\bar{K}$ at 4.2 GeV/c. In a CERN ISR experiment, LOCKMAN 78 reports a narrow 6 standard-deviation enhancement at 1572 MeV in $\Lambda\pi^\pm$ from the reaction $pp \rightarrow \Lambda\pi^+\pi^-X$. These enhancements are unlikely to be associated with the $\Sigma(1580)$ (which has not been confirmed by several recent experiments – see the next entry in the Listings).

CARROLL 76 observes a bump at 1550 MeV (as well as one at 1580 MeV) in the isospin-1 $\bar{K}N$ total cross section, but uncertainties in cross section measurements outside the mass range of the experiment preclude estimating its significance.

See also MEADOWS 80 for a review of this state.

Σ(1560) MASS (PRODUCTION EXPERIMENTS)

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
≈ 1560 OUR ESTIMATE					
1553±7	121	DIONISI	78B HBC	±	$K^-p \rightarrow (Y\pi)K\bar{K}$
1572±4	40	LOCKMAN	78 SPEC	±	$pp \rightarrow \Lambda\pi^+\pi^-X$

Σ(1560) WIDTH (PRODUCTION EXPERIMENTS)

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
79±30	121	DIONISI	78B HBC	±	$K^-p \rightarrow (Y\pi)K\bar{K}$
15±6	40	¹ LOCKMAN	78 SPEC	±	$pp \rightarrow \Lambda\pi^+\pi^-X$

Σ(1560) DECAY MODES (PRODUCTION EXPERIMENTS)

Mode	Fraction (Γ_j/Γ)
$\Gamma_1 \quad \Lambda\pi$	seen
$\Gamma_2 \quad \Sigma\pi$	

$\Sigma(1560)$ BRANCHING RATIOS (PRODUCTION EXPERIMENTS)

$\Gamma(\Sigma\pi)/[\Gamma(\Lambda\pi) + \Gamma(\Sigma\pi)]$					$\Gamma_2/(\Gamma_1+\Gamma_2)$
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>	
0.35 ± 0.12	DIONISI	78B HBC	±	$K^- p \rightarrow$ $(Y\pi)K\bar{K}$	
<hr/>					
$\Gamma(\Lambda\pi)/\Gamma_{\text{total}}$					Γ_1/Γ
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>	
seen	LOCKMAN	78 SPEC	±	$p p \rightarrow \Lambda\pi^+\pi^- X$	

$\Sigma(1560)$ FOOTNOTES (PRODUCTION EXPERIMENTS)

¹ The width observed by LOCKMAN 78 is consistent with experimental resolution.

$\Sigma(1560)$ REFERENCES (PRODUCTION EXPERIMENTS)

MEADOWS	80	Toronto Conf. 283	B.T. Meadows	
DIONISI	78B	PL 78B 154	C. Dionisi, R. Armenteros, J. Diaz	(CERN, AMST+) I
LOCKMAN	78	Saclay DPHPE 78-01	W. Lockman <i>et al.</i>	(UCLA, SACL)
CARROLL	76	PRL 37 806	A.S. Carroll <i>et al.</i>	(BNL) I