$\Sigma(1560)$ Bumps

$I(J^P) = 1(?^?)$ 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 $K^- p \to (\Lambda/\Sigma)\pi K\overline{K}$ 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 $pp \to \Lambda\pi^+\pi^- X$. 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 $\overline{K}N$ 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.

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

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

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

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

$\Sigma(1560)$ DECAY MODES (PRODUCTION EXPERIMENTS)

	Mode	Fraction (Γ_i/Γ)
Γ_1	$\Lambda\pi$	seen
Γ_2	$\Sigma\pi$	

Σ(1560) BRANCHING RATIOS (PRODUCTION EXPERIMENTS)

$\Gamma(\Sigma\pi)/[\Gamma(\Lambda\pi)+\Gamma(\Sigma\pi)]$ **$\Gamma_2/(\Gamma_1+\Gamma_2)$**

VALUE	DOCUMENT ID		TECN	CHG	COMMENT
0.35 ± 0.12	DIONISI	78B	HBC	±	$K^- p \rightarrow (Y\pi) K\overline{K}$

$\Gamma(\Lambda\pi)/\Gamma_{\text{total}}$ **Γ_1/Γ**

VALUE	DOCUMENT ID		TECN	CHG	COMMENT
seen	LOCKMAN	78	SPEC	±	$pp \rightarrow \Lambda\pi^+\pi^- X$

Σ(1560) FOOTNOTES (PRODUCTION EXPERIMENTS)

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

Σ(1560) REFERENCES (PRODUCTION EXPERIMENTS)

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