# $\Sigma(1560)$ 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 $K^- p \rightarrow (\Lambda/\Sigma)\pi K\overline{K}$ 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 $pp \rightarrow \Lambda\pi^+\pi^- X$. 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 $\overline{K}N$ 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 | ± | $K^- p \rightarrow (Y\pi)K\overline{K}$ |
| 1572±4 | 40 | LOCKMAN | 78 | SPEC | ± | $pp \rightarrow \Lambda\pi^+\pi^- X$ |

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

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

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

| | Mode | Fraction ($\Gamma_i/\Gamma$) |
|---|---|---|
| $\Gamma_1$ | $\Lambda\pi$ | seen |
| $\Gamma_2$ | $\Sigma\pi$ | |

## 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 | ± | $K^- p \rightarrow (Y\pi) K \overline{K}$ |

**$\Gamma(\Lambda\pi)/\Gamma_{total}$** **$\Gamma_1/\Gamma$**

| 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 |