

**$\Sigma(1560)$  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.

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

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

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

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

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

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

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## $\Sigma(1560)$ 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        | ±              | $K^- p \rightarrow (Y\pi) K \bar{K}$ |

| $\Gamma(\Lambda\pi)/\Gamma_{\text{total}}$ | $\Gamma_1/\Gamma$  |             |            |                |                                      |
|--|--------------------|-------------|------------|----------------|--------------------------------------|
| <u>VALUE</u>                               | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>CHG</u> | <u>COMMENT</u> |                                      |
| <b>seen</b>                                | LOCKMAN            | 78          | SPEC       | ±              | $pp \rightarrow \Lambda\pi^+\pi^- X$ |

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

<sup>1</sup> 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         |