

**$\rho_5(2350)$** 

$$I^G(J^{PC}) = 1^+(5^{--})$$

OMITTED FROM SUMMARY TABLE

This entry was previously called  $U_1(2400)$ . See also  $\rho(2150)$ ,  $f_2(2150)$ ,  $\rho_3(2250)$ ,  $f_4(2300)$ .

 **$\rho_5(2350)$  MASS** **$\pi^- p \rightarrow \omega \pi^0 n$** 

| VALUE (MeV)    | DOCUMENT ID | TECN | CHG  | COMMENT                                 |
|----------------|-------------|------|------|-----------------------------------------|
| <b>2330±35</b> | ALDE        | 95   | GAM2 | 38 $\pi^- p \rightarrow \omega \pi^0 n$ |

 **$\bar{p} p \rightarrow \pi\pi$  or  $\bar{K} K$** 

| VALUE (MeV)                                                                   | DOCUMENT ID         | TECN | CHG    | COMMENT                                 |
|-------------------------------------------------------------------------------|---------------------|------|--------|-----------------------------------------|
| • • • We do not use the following data for averages, fits, limits, etc. • • • |                     |      |        |                                         |
| ~ 2303                                                                        | HASAN               | 94   | RVUE   | $\bar{p} p \rightarrow \pi\pi$          |
| ~ 2300                                                                        | <sup>1</sup> MARTIN | 80B  | RVUE   |                                         |
| ~ 2250                                                                        | <sup>1</sup> MARTIN | 80C  | RVUE   |                                         |
| ~ 2500                                                                        | <sup>2</sup> CARTER | 78B  | CNTR 0 | 0.7–2.4 $\bar{p} p \rightarrow K^- K^+$ |
| ~ 2480                                                                        | <sup>3</sup> CARTER | 77   | CNTR 0 | 0.7–2.4 $\bar{p} p \rightarrow \pi\pi$  |

**S-CHANNEL  $\bar{N} N$** 

| VALUE (MeV)                                                                   | DOCUMENT ID              | TECN | CHG     | COMMENT                                                                     |
|-------------------------------------------------------------------------------|--------------------------|------|---------|-----------------------------------------------------------------------------|
| • • • We do not use the following data for averages, fits, limits, etc. • • • |                          |      |         |                                                                             |
| 2300±45                                                                       | <sup>4</sup> ANISOVICH   | 02   | SPEC    | 0.6–1.9 $p\bar{p} \rightarrow \omega \pi^0, \omega \eta \pi^0, \pi^+ \pi^-$ |
| 2295±30                                                                       | ANISOVICH                | 00J  | SPEC    |                                                                             |
| ~ 2380                                                                        | <sup>5</sup> CUTTS       | 78B  | CNTR    | 0.97–3 $\bar{p} p \rightarrow \bar{N} N$                                    |
| 2345±15                                                                       | <sup>5,6</sup> COUPLAND  | 77   | CNTR 0  | 0.7–2.4 $\bar{p} p \rightarrow \bar{p} p$                                   |
| 2359±2                                                                        | <sup>5,7</sup> ALSPECTOR | 73   | CNTR    | $\bar{p} p$ S channel                                                       |
| 2350±10                                                                       | <sup>8</sup> ABRAMS      | 70   | CNTR    | S channel $\bar{N} N$                                                       |
| 2360±25                                                                       | <sup>9</sup> OH          | 70B  | HDBC -0 | $\bar{p}(pn), K^* K 2\pi$                                                   |

 **$\pi^- p \rightarrow K^+ K^- n$** 

| VALUE (MeV)                                                                   | DOCUMENT ID | TECN | CHG    | COMMENT                            |
|-------------------------------------------------------------------------------|-------------|------|--------|------------------------------------|
| • • • We do not use the following data for averages, fits, limits, etc. • • • |             |      |        |                                    |
| 2307±6                                                                        | ALPER       | 80   | CNTR 0 | 62 $\pi^- p \rightarrow K^+ K^- n$ |

<sup>1</sup>  $I(J^P) = 1(5^-)$  from simultaneous analysis of  $p\bar{p} \rightarrow \pi^- \pi^+$  and  $\pi^0 \pi^0$ .

<sup>2</sup>  $I = 0(1); J^P = 5^-$  from Barrelet-zero analysis.

<sup>3</sup>  $I(J^P) = 1(5^-)$  from amplitude analysis.

<sup>4</sup> From the combined analysis of ANISOVICH 00J, ANISOVICH 01D, ANISOVICH 01E, and ANISOVICH 02.

<sup>5</sup> Isospins 0 and 1 not separated.

<sup>6</sup> From a fit to the total elastic cross section.

<sup>7</sup> Referred to as  $U$  or  $U$  region by ALSPECTOR 73.

<sup>8</sup> For  $I = 1 \bar{N} N$ .

<sup>9</sup> No evidence for this bump seen in the  $\bar{p} p$  data of CHAPMAN 71B. Narrow state not confirmed by OH 73 with more data.

$\rho_5(2350)$  WIDTH $\pi^- p \rightarrow \omega \pi^0 n$ 

| VALUE (MeV)    | DOCUMENT ID | TECN | CHG  | COMMENT                                 |
|----------------|-------------|------|------|-----------------------------------------|
| <b>400±100</b> | ALDE        | 95   | GAM2 | 38 $\pi^- p \rightarrow \omega \pi^0 n$ |

 $\bar{p} p \rightarrow \pi\pi$  or  $\bar{K}K$ 

| VALUE (MeV)                                                                   | DOCUMENT ID          | TECN | CHG    | COMMENT                                 |
|-------------------------------------------------------------------------------|----------------------|------|--------|-----------------------------------------|
| • • • We do not use the following data for averages, fits, limits, etc. • • • |                      |      |        |                                         |
| ~ 169                                                                         | HASAN                | 94   | RVUE   | $\bar{p} p \rightarrow \pi\pi$          |
| ~ 250                                                                         | <sup>10</sup> MARTIN | 80B  | RVUE   |                                         |
| ~ 300                                                                         | <sup>10</sup> MARTIN | 80C  | RVUE   |                                         |
| ~ 150                                                                         | <sup>11</sup> CARTER | 78B  | CNTR 0 | 0.7–2.4 $\bar{p} p \rightarrow K^- K^+$ |
| ~ 210                                                                         | <sup>12</sup> CARTER | 77   | CNTR 0 | 0.7–2.4 $\bar{p} p \rightarrow \pi\pi$  |

**S-CHANNEL  $\bar{N}N$** 

| VALUE (MeV)                                                                   | DOCUMENT ID               | TECN | CHG     | COMMENT                                                                     |
|-------------------------------------------------------------------------------|---------------------------|------|---------|-----------------------------------------------------------------------------|
| • • • We do not use the following data for averages, fits, limits, etc. • • • |                           |      |         |                                                                             |
| 260± 75                                                                       | <sup>13</sup> ANISOVICH   | 02   | SPEC    | 0.6–1.9 $p\bar{p} \rightarrow \omega \pi^0, \omega \eta \pi^0, \pi^+ \pi^-$ |
| 235 <sup>+</sup> <sub>–</sub> 65<br>40                                        | ANISOVICH                 | 00J  | SPEC    |                                                                             |
| 135 <sup>+</sup> <sub>–</sub> 150<br>65                                       | <sup>14,15</sup> COUPLAND | 77   | CNTR 0  | 0.7–2.4 $\bar{p} p \rightarrow \bar{p} p$                                   |
| 165 <sup>+</sup> <sub>–</sub> 18<br>8                                         | <sup>15</sup> ALSPECTOR   | 73   | CNTR    | $\bar{p} p$ S channel                                                       |
| < 60                                                                          | <sup>16</sup> OH          | 70B  | HDBC –0 | $\bar{p}(pn), K^* K 2\pi$                                                   |
| ~ 140                                                                         | ABRAMS                    | 67C  | CNTR    | S channel $\bar{p} N$                                                       |

 $\pi^- p \rightarrow K^+ K^- n$ 

| VALUE (MeV)                                                                                                                              | DOCUMENT ID | TECN | CHG    | COMMENT                            |
|------------------------------------------------------------------------------------------------------------------------------------------|-------------|------|--------|------------------------------------|
| • • • We do not use the following data for averages, fits, limits, etc. • • •                                                            |             |      |        |                                    |
| 245±20                                                                                                                                   | ALPER       | 80   | CNTR 0 | 62 $\pi^- p \rightarrow K^+ K^- n$ |
| <sup>10</sup> $I(J^P) = 1(5^-)$ from simultaneous analysis of $p\bar{p} \rightarrow \pi^- \pi^+$ and $\pi^0 \pi^0$ .                     |             |      |        |                                    |
| <sup>11</sup> $I = 0(1); J^P = 5^-$ from Barrelet-zero analysis.                                                                         |             |      |        |                                    |
| <sup>12</sup> $I(J^P) = 1(5^-)$ from amplitude analysis.                                                                                 |             |      |        |                                    |
| <sup>13</sup> From the combined analysis of ANISOVICH 00J, ANISOVICH 01D, ANISOVICH 01E, and ANISOVICH 02.                               |             |      |        |                                    |
| <sup>14</sup> From a fit to the total elastic cross section.                                                                             |             |      |        |                                    |
| <sup>15</sup> Isospins 0 and 1 not separated.                                                                                            |             |      |        |                                    |
| <sup>16</sup> No evidence for this bump seen in the $\bar{p} p$ data of CHAPMAN 71B. Narrow state not confirmed by OH 73 with more data. |             |      |        |                                    |

 $\rho_5(2350)$  REFERENCES

|           |     |              |                              |                           |
|-----------|-----|--------------|------------------------------|---------------------------|
| ANISOVICH | 02  | PL B542 8    | A.V. Anisovich <i>et al.</i> |                           |
| ANISOVICH | 01D | PL B508 6    | A.V. Anisovich <i>et al.</i> |                           |
| ANISOVICH | 01E | PL B513 281  | A.V. Anisovich <i>et al.</i> |                           |
| ANISOVICH | 00J | PL B491 47   | A.V. Anisovich <i>et al.</i> | (RAL, LOQM, PNPI+)        |
| ALDE      | 95  | ZPHY C66 379 | D.M. Alde <i>et al.</i>      | (GAMS Collab.) JP         |
| HASAN     | 94  | PL B334 215  | A. Hasan, D.V. Bugg          | (LOQM)                    |
| ALPER     | 80  | PL 94B 422   | B. Alper <i>et al.</i>       | (AMST, CERN, CRAC, MPIM+) |
| MARTIN    | 80B | NP B176 355  | B.R. Martin, D. Morgan       | (LOUC, RHEL) JP           |
| MARTIN    | 80C | NP B169 216  | A.D. Martin, M.R. Pennington | (DURH) JP                 |

|           |     |             |                            |                 |
|-----------|-----|-------------|----------------------------|-----------------|
| CARTER    | 78B | NP B141 467 | A.A. Carter                | (LOQM)          |
| CUTTS     | 78B | PR D17 16   | D. Cutts <i>et al.</i>     | (STON, WISC)    |
| CARTER    | 77  | PL 67B 117  | A.A. Carter <i>et al.</i>  | (LOQM, RHEL) JP |
| COUPLAND  | 77  | PL 71B 460  | M. Coupland <i>et al.</i>  | (LOQM, RHEL)    |
| ALSPECTOR | 73  | PRL 30 511  | J. Alspector <i>et al.</i> | (RUTG, UPNJ)    |
| OH        | 73  | NP B51 57   | B.Y. Oh <i>et al.</i>      | (MSU)           |
| CHAPMAN   | 71B | PR D4 1275  | J.W. Chapman <i>et al.</i> | (MICH)          |
| ABRAMS    | 70  | PR D1 1917  | R.J. Abrams <i>et al.</i>  | (BNL)           |
| OH        | 70B | PRL 24 1257 | B.Y. Oh <i>et al.</i>      | (MSU)           |
| ABRAMS    | 67C | PRL 18 1209 | R.J. Abrams <i>et al.</i>  | (BNL)           |

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