# $a_1(1260)$

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

See also our review under the $a_1(1260)$ in PDG 06, Journal of Physics **G33** 1 (2006).

## $a_1(1260)$ T-MATRIX POLE $\sqrt{s}$

Note that $\Gamma = -2\ \mathrm{Im}(\sqrt{s})$.

| VALUE (MeV) | DOCUMENT ID | TECN | COMMENT |
|---|---|---|---|
| **$(1209^{+13}_{-10}) - i(288^{+45}_{-12})$ OUR ESTIMATE** | | | |
| $(1209 \pm 4^{+12}_{-9}) - i\ (288 \pm 6^{+45}_{-10})$ | MIKHASENKO 18 | RVUE | $\tau^- \to \pi^-\pi^+\pi^-\nu_\tau$ |

## $a_1(1260)$ MASS

| VALUE (MeV) | | | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|---|---|
| **1230** | **±40** | **OUR ESTIMATE** | | | | | |
| **1299** | $^{+12}_{-28}$ | | 46M | [1] AGHASYAN | 18B | COMP | $190\ \pi^- p \to \pi^-\pi^+\pi^- p$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | | | |
| 1195.05 | ± 1.05 | ± 6.33 | 894k | AAIJ | 18AI | LHCB | $D^0 \to K^\mp\pi^\pm\pi^\pm\pi^\mp$ |
| 1225 | ± 9 | ±20 | 7k | [2] DARGENT | 17 | RVUE | $D^0 \to \pi^-\pi^+\pi^-\pi^+$ |
| 1255 | ± 6 | $^{+7}_{-17}$ | 420k | [3] ALEKSEEV | 10 | COMP | $190\ \pi^- Pb \to \pi^-\pi^-\pi^+ Pb'$ |
| 1243 | ±12 | ±20 | | [4] AUBERT | 07AU | BABR | $10.6\ e^+e^- \to \rho^0\rho^\pm\pi^\mp\gamma$ |
| 1230–1270 | | | 6360 | [5] LINK | 07A | FOCS | $D^0 \to \pi^-\pi^+\pi^-\pi^+$ |
| 1203 | ± 3 | | | [6] GOMEZ-DUM... | 04 | RVUE | $\tau^+ \to \pi^+\pi^+\pi^-\nu_\tau$ |
| 1330 | ±24 | | 90k | SALVINI | 04 | OBLX | $\overline{p}p \to 2\pi^+2\pi^-$ |
| 1331 | ±10 | ± 3 | 37k | [7] ASNER | 00 | CLE2 | $10.6\ e^+e^- \to \tau^+\tau^-$, $\tau^- \to \pi^-\pi^0\pi^0\nu_\tau$ |
| 1255 | ± 7 | ± 6 | 5904 | [8] ABREU | 98G | DLPH | $e^+e^-$ |
| 1207 | ± 5 | ± 8 | 5904 | [9] ABREU | 98G | DLPH | $e^+e^-$ |
| 1196 | ± 4 | ± 5 | 5904 | [10,11] ABREU | 98G | DLPH | $e^+e^-$ |
| 1240 | ±10 | | | BARBERIS | 98B | | $450\ pp \to p_f\pi^+\pi^-\pi^0 p_s$ |
| 1262 | ± 9 | ± 7 | | [8,12] ACKERSTAFF | 97R | OPAL | $E^{ee}_{cm}$= 88–94, $\tau \to 3\pi\nu$ |
| 1210 | ± 7 | ± 2 | | [9,12] ACKERSTAFF | 97R | OPAL | $E^{ee}_{cm}$= 88–94, $\tau \to 3\pi\nu$ |
| 1211 | ± 7 | $^{+50}_{-0}$ | | [9] ALBRECHT | 93C | ARG | $\tau^+ \to \pi^+\pi^+\pi^-\nu$ |
| 1121 | ± 8 | | | [13] ANDO | 92 | SPEC | $8\ \pi^- p \to \pi^+\pi^-\pi^0 n$ |
| 1242 | ±37 | | | [14] IVANOV | 91 | RVUE | $\tau \to \pi^+\pi^+\pi^-\nu$ |
| 1260 | ±14 | | | [15] IVANOV | 91 | RVUE | $\tau \to \pi^+\pi^+\pi^-\nu$ |
| 1250 | ± 9 | | | [16] IVANOV | 91 | RVUE | $\tau \to \pi^+\pi^+\pi^-\nu$ |
| 1208 | ±15 | | | ARMSTRONG | 90 | OMEG | $300.0 pp \to pp\pi^+\pi^-\pi^0$ |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1220 | $\pm 15$ | | [17] ISGUR | 89 | RVUE | $\tau^+ \to \pi^+\pi^+\pi^-\nu$ |
| 1260 | $\pm 25$ | | [18] BOWLER | 88 | RVUE | |
| 1166 | $\pm 18$ | $\pm 11$ | BAND | 87 | MAC | $\tau^+ \to \pi^+\pi^+\pi^-\nu$ |
| 1164 | $\pm 41$ | $\pm 23$ | BAND | 87 | MAC | $\tau^+ \to \pi^+\pi^0\pi^0\nu$ |
| 1250 | $\pm 40$ | | [17] TORNQVIST | 87 | RVUE | |
| 1046 | $\pm 11$ | | ALBRECHT | 86B | ARG | $\tau^+ \to \pi^+\pi^+\pi^-\nu$ |
| 1056 | $\pm 20$ | $\pm 15$ | RUCKSTUHL | 86 | DLCO | $\tau^+ \to \pi^+\pi^+\pi^-\nu$ |
| 1194 | $\pm 14$ | $\pm 10$ | SCHMIDKE | 86 | MRK2 | $\tau^+ \to \pi^+\pi^+\pi^-\nu$ |
| 1255 | $\pm 23$ | | BELLINI | 85 | SPEC | $40\ \pi^- A \to \pi^-\pi^+\pi^- A$ |
| 1240 | $\pm 80$ | | [19] DANKOWY... | 81 | SPEC | $8.45\ \pi^- p \to n 3\pi$ |
| 1280 | $\pm 30$ | | [19] DAUM | 81B | CNTR | $63{,}94\ \pi^- p \to p 3\pi$ |
| 1041 | $\pm 13$ | | [20] GAVILLET | 77 | HBC | $4.2\ K^- p \to \Sigma 3\pi$ |

[1] Statistical error negligible.
[2] Reanalysis of CLEO data using Breit-Wigner parameterization.
[3] Superseded by AGHASYAN 2018B.
[4] The $\rho^\pm\pi^\mp$ state can be also due to the $\pi(1300)$.
[5] Using the Breit-Wigner parameterization; strong correlation between mass and width.
[6] Using the data of BARATE 98R.
[7] From a fit to the $3\pi$ mass spectrum including the $K\overline{K}^*(892)$ threshold.
[8] Uses the model of KUHN 90.
[9] Uses the model of ISGUR 89.
[10] Includes the effect of a possible $a_1'$ state.
[11] Uses the model of FEINDT 90.
[12] Supersedes AKERS 95P.
[13] Average and spread of values using 2 variants of the model of BOWLER 75.
[14] Reanalysis of RUCKSTUHL 86.
[15] Reanalysis of SCHMIDKE 86.
[16] Reanalysis of ALBRECHT 86B.
[17] From a combined reanalysis of ALBRECHT 86B, SCHMIDKE 86, and RUCKSTUHL 86.
[18] From a combined reanalysis of ALBRECHT 86B and DAUM 81B.
[19] Uses the model of BOWLER 75.
[20] Produced in $K^-$ backward scattering.

## $a_1(1260)$ WIDTH

| VALUE (MeV) | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **250 to 600 OUR ESTIMATE** | | | | | |
| **380 ± 80** | 46M | [1] AGHASYAN | 18B | COMP | $190\ \pi^- p \to \pi^-\pi^+\pi^- p$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| $422.01 \pm 2.10 \pm 12.72$ | 894k | AAIJ | 18AI | LHCB | $D^0 \to K^\mp\pi^\pm\pi^\pm\pi^\mp$ |
| $430 \pm 24 \pm 31$ | | [2] DARGENT | 17 | RVUE | $D^0 \to \pi^-\pi^+\pi^-\pi^+$ |
| $367 \pm 9\ {}^{+28}_{-25}$ | 420k | [3] ALEKSEEV | 10 | COMP | $190\ \pi^- Pb \to \pi^-\pi^-\pi^+ Pb'$ |
| $410 \pm 31 \pm 30$ | | [4] AUBERT | 07AU | BABR | $10.6\ e^+e^- \to \rho^0\rho^\pm\pi^\mp\gamma$ |
| 520–680 | 6360 | [5] LINK | 07A | FOCS | $D^0 \to \pi^-\pi^+\pi^-\pi^+$ |
| $480 \pm 20$ | | [6] GOMEZ-DUM.. | 04 | RVUE | $\tau^+ \to \pi^+\pi^+\pi^-\nu_\tau$ |
| $580 \pm 41$ | 90k | SALVINI | 04 | OBLX | $\overline{p}p \to 2\pi^+ 2\pi^-$ |
| $460 \pm 85$ | 205 | [7] DRUTSKOY | 02 | BELL | $B \to D^{(*)} K^- K^{*0}$ |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 814 | $\pm$ 36 | $\pm$ 13 | 37k | [8] ASNER | 00 | CLE2 | 10.6 $e^+e^- \to \tau^+\tau^-$, $\tau^- \to \pi^-\pi^0\pi^0\nu_\tau$ |
| 450 | $\pm$ 50 | | 22k | [9] AKHMETSHIN | 99E | CMD2 | 1.05–1.38 $e^+e^- \to \pi^+\pi^-\pi^0\pi^0$ |
| 570 | $\pm$ 10 | | | [10] BONDAR | 99 | RVUE | $e^+e^- \to 4\pi$, $\tau \to 3\pi\nu_\tau$ |
| 587 | $\pm$ 27 | $\pm$ 21 | 5904 | [11] ABREU | 98G | DLPH | $e^+e^-$ |
| 478 | $\pm$ 3 | $\pm$ 15 | 5904 | [12] ABREU | 98G | DLPH | $e^+e^-$ |
| 425 | $\pm$ 14 | $\pm$ 8 | 5904 | [13,14] ABREU | 98G | DLPH | $e^+e^-$ |
| 400 | $\pm$ 35 | | | BARBERIS | 98B | | 450 $pp \to p_f\pi^+\pi^-\pi^0 p_s$ |
| 621 | $\pm$ 32 | $\pm$ 58 | | [11,15] ACKERSTAFF | 97R | OPAL | $E^{ee}_{cm}$= 88–94, $\tau \to 3\pi\nu$ |
| 457 | $\pm$ 15 | $\pm$ 17 | | [12,15] ACKERSTAFF | 97R | OPAL | $E^{ee}_{cm}$= 88–94, $\tau \to 3\pi\nu$ |
| 446 | $\pm$ 21 | $^{+140}_{-\ \ 0}$ | | [12] ALBRECHT | 93C | ARG | $\tau^+ \to \pi^+\pi^+\pi^-\nu$ |
| 239 | $\pm$ 11 | | | ANDO | 92 | SPEC | 8 $\pi^- p \to \pi^+\pi^-\pi^0 n$ |
| 266 | $\pm$ 13 | $\pm$ 4 | | [16] ANDO | 92 | SPEC | 8 $\pi^- p \to \pi^+\pi^-\pi^0 n$ |
| 465 | $^{+228}_{-143}$ | | | [17] IVANOV | 91 | RVUE | $\tau \to \pi^+\pi^+\pi^-\nu$ |
| 298 | $^{+\ 40}_{-\ 34}$ | | | [18] IVANOV | 91 | RVUE | $\tau \to \pi^+\pi^+\pi^-\nu$ |
| 488 | $\pm$ 32 | | | [19] IVANOV | 91 | RVUE | $\tau \to \pi^+\pi^+\pi^-\nu$ |
| 430 | $\pm$ 50 | | | ARMSTRONG | 90 | OMEG | 300.0$pp \to pp\pi^+\pi^-\pi^0$ |
| 420 | $\pm$ 40 | | | [20] ISGUR | 89 | RVUE | $\tau^+ \to \pi^+\pi^+\pi^-\nu$ |
| 396 | $\pm$ 43 | | | [21] BOWLER | 88 | RVUE | |
| 405 | $\pm$ 75 | $\pm$ 25 | | BAND | 87 | MAC | $\tau^+ \to \pi^+\pi^+\pi^-\nu$ |
| 419 | $\pm$108 | $\pm$ 57 | | BAND | 87 | MAC | $\tau^+ \to \pi^+\pi^0\pi^0\nu$ |
| 521 | $\pm$ 27 | | | ALBRECHT | 86B | ARG | $\tau^+ \to \pi^+\pi^+\pi^-\nu$ |
| 476 | $^{+132}_{-120}$ | $\pm$ 54 | | RUCKSTUHL | 86 | DLCO | $\tau^+ \to \pi^+\pi^+\pi^-\nu$ |
| 462 | $\pm$ 56 | $\pm$ 30 | | SCHMIDKE | 86 | MRK2 | $\tau^+ \to \pi^+\pi^+\pi^-\nu$ |
| 292 | $\pm$ 40 | | | BELLINI | 85 | SPEC | 40 $\pi^- A \to \pi^-\pi^+\pi^- A$ |
| 380 | $\pm$100 | | | [22] DANKOWY... | 81 | SPEC | 8.45 $\pi^- p \to n 3\pi$ |
| 300 | $\pm$ 50 | | | [22] DAUM | 81B | CNTR | 63,94 $\pi^- p \to p 3\pi$ |
| 230 | $\pm$ 50 | | | [23] GAVILLET | 77 | HBC | 4.2 $K^- p \to \Sigma 3\pi$ |

[1] Statistical error negligible.
[2] Reanalysis of CLEO data using Breit-Wigner parameterization.
[3] Superseded by AGHASYAN 2018B.
[4] The $\rho^\pm\pi^\mp$ state can be also due to the $\pi(1300)$.
[5] Using the Breit-Wigner parameterization; strong correlation between mass and width.
[6] Using the data of BARATE 98R.
[7] From a fit of the $K^- K^{*0}$ distribution assuming $m_{a_1}$= 1230 MeV and purely resonant production of the $K^- K^{*0}$ system.
[8] From a fit to the $3\pi$ mass spectrum including the $K\overline{K}^*(892)$ threshold.
[9] Using the $a_1(1260)$ mass of 1230 MeV.
[10] From AKHMETSHIN 99E and ASNER 00 data using the $a_1(1260)$ mass of 1230 MeV.

[11] Uses the model of KUHN 90.
[12] Uses the model of ISGUR 89.
[13] Includes the effect of a possible $a_1'$ state.
[14] Uses the model of FEINDT 90.
[15] Supersedes AKERS 95P.
[16] Average and spread of values using 2 variants of the model of BOWLER 75.
[17] Reanalysis of RUCKSTUHL 86.
[18] Reanalysis of SCHMIDKE 86.
[19] Reanalysis of ALBRECHT 86B.
[20] From a combined reanalysis of ALBRECHT 86B, SCHMIDKE 86, and RUCKSTUHL 86.
[21] From a combined reanalysis of ALBRECHT 86B and DAUM 81B.
[22] Uses the model of BOWLER 75.
[23] Produced in $K^-$ backward scattering.

## $a_1(1260)$ DECAY MODES

| | Mode | Fraction ($\Gamma_i/\Gamma$) |
|---|---|---|
| $\Gamma_1$ | $3\pi$ | seen |
| $\Gamma_2$ | $(\rho\pi)_{S-\text{wave}}$, $\rho \to \pi\pi$ | seen |
| $\Gamma_3$ | $(\rho\pi)_{D-\text{wave}}$, $\rho \to \pi\pi$ | seen |
| $\Gamma_4$ | $(\rho(1450)\pi)_{S-\text{wave}}$, $\rho \to \pi\pi$ | seen |
| $\Gamma_5$ | $(\rho(1450)\pi)_{D-\text{wave}}$, $\rho \to \pi\pi$ | seen |
| $\Gamma_6$ | $f_0(500)\pi$, $f_0 \to \pi\pi$ | seen |
| $\Gamma_7$ | $f_0(980)\pi$, $f_0 \to \pi\pi$ | seen |
| $\Gamma_8$ | $f_0(1370)\pi$, $f_0 \to \pi\pi$ | seen |
| $\Gamma_9$ | $f_2(1270)\pi$, $f_2 \to \pi\pi$ | seen |
| $\Gamma_{10}$ | $\pi^+\pi^-\pi^0$ | seen |
| $\Gamma_{11}$ | $\pi^0\pi^0\pi^0$ | not seen |
| $\Gamma_{12}$ | $KK\pi$ | seen |
| $\Gamma_{13}$ | $K^*(892)K$ | seen |
| $\Gamma_{14}$ | $\pi\gamma$ | seen |

## $a_1(1260)$ PARTIAL WIDTHS

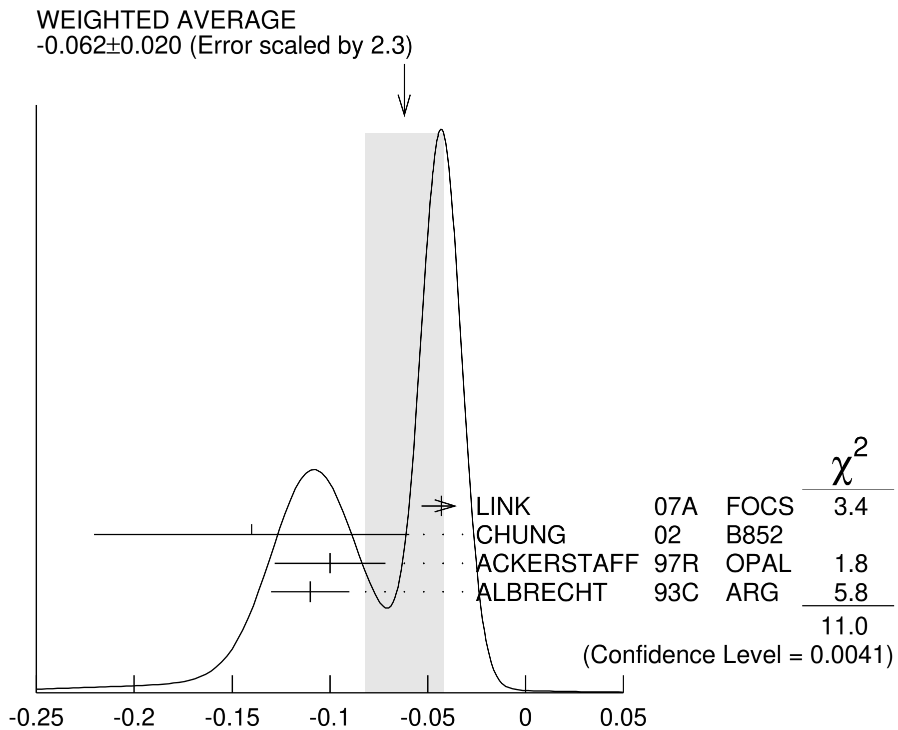
### $\Gamma(\pi\gamma)$ — $\Gamma_{14}$

| VALUE (keV) | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|
| **640±246** | ZIELINSKI | 84C | SPEC | 200 $\pi^+ Z \to Z 3\pi$ |

## D-wave/S-wave AMPLITUDE RATIO IN DECAY OF $a_1(1260) \to \rho\pi$

| VALUE | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|
| **−0.062±0.020 OUR AVERAGE** Error includes scale factor of 2.3. See the ideogram below. | | | | |
| −0.043±0.009±0.005 | LINK | 07A | FOCS | $D^0 \to \pi^-\pi^+\pi^-\pi^+$ |
| −0.14 ±0.04 ±0.07 | [1] CHUNG | 02 | B852 | 18.3 $\pi^- p \to \pi^+\pi^-\pi^- p$ |
| −0.10 ±0.02 ±0.02 | [2,3] ACKERSTAFF | 97R | OPAL | $E_{\text{cm}}^{ee}$= 88–94, $\tau \to 3\pi\nu$ |
| −0.11 ±0.02 | [2] ALBRECHT | 93C | ARG | $\tau^+ \to \pi^+\pi^+\pi^-\nu$ |

[1] Deck-type background not subtracted.
[2] Uses the model of ISGUR 89.
[3] Supersedes AKERS 95P.




*D*-wave/*S*-wave AMPLITUDE RATIO IN DECAY OF $a_1(1260) \to \rho\pi$

## $a_1$(1260) BRANCHING RATIOS

### $\Gamma\big((\rho\pi)_{S-\text{wave}},\ \rho \to \pi\pi\big)/\Gamma_{\text{total}}$ — $\Gamma_2/\Gamma$

| *VALUE* (units $10^{-2}$) | *EVTS* | *DOCUMENT ID* | | *TECN* | *COMMENT* |
|---|---|---|---|---|---|
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| 60.19 | 37k | [1] ASNER | 00 | CLE2 | 10.6 $e^+e^- \to \tau^+\tau^-$, $\tau^- \to \pi^-\pi^0\pi^0\nu_\tau$ |

[1] From a fit to the Dalitz plot.

### $\Gamma\big((\rho\pi)_{D-\text{wave}},\ \rho \to \pi\pi\big)/\Gamma_{\text{total}}$ — $\Gamma_3/\Gamma$

| *VALUE* (units $10^{-2}$) | *EVTS* | *DOCUMENT ID* | | *TECN* | *COMMENT* |
|---|---|---|---|---|---|
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| $1.30 \pm 0.60 \pm 0.22$ | 37k | [1] ASNER | 00 | CLE2 | 10.6 $e^+e^- \to \tau^+\tau^-$, $\tau^- \to \pi^-\pi^0\pi^0\nu_\tau$ |

[1] From a fit to the Dalitz plot.

### $\Gamma\big((\rho(1450)\pi)_{S-\text{wave}},\ \rho \to \pi\pi\big)/\Gamma_{\text{total}}$ — $\Gamma_4/\Gamma$

| *VALUE* (units $10^{-2}$) | *EVTS* | *DOCUMENT ID* | | *TECN* | *COMMENT* |
|---|---|---|---|---|---|
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| $0.56 \pm 0.84 \pm 0.32$ | 37k | [1,2] ASNER | 00 | CLE2 | 10.6 $e^+e^- \to \tau^+\tau^-$, $\tau^- \to \pi^-\pi^0\pi^0\nu_\tau$ |

[1] From a fit to the Dalitz plot.
[2] Assuming for $\rho(1450)$ mass and width of 1370 and 386 MeV respectively.

## $\Gamma\big((\rho(1450)\pi)_{D-\text{wave}},\ \rho \to \pi\pi\big)/\Gamma_{\text{total}}$ — $\Gamma_5/\Gamma$

| VALUE (units $10^{-2}$) | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| $2.04 \pm 1.20 \pm 0.28$ | 37k | [1,2] ASNER | 00 | CLE2 | $10.6\ e^+e^- \to \tau^+\tau^-$, $\tau^- \to \pi^-\pi^0\pi^0\nu_\tau$ |

[1] From a fit to the Dalitz plot.
[2] Assuming for $\rho(1450)$ mass and width of 1370 and 386 MeV respectively.

## $\Gamma\big(f_0(500)\pi,\ f_0 \to \pi\pi\big)/\Gamma_{\text{total}}$ — $\Gamma_6/\Gamma$

| VALUE (units $10^{-2}$) | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| seen | | CHUNG | 02 | B852 | $18.3\ \pi^- p \to \pi^+\pi^-\pi^- p$ |
| $18.76 \pm 4.29 \pm 1.48$ | 37k | [1,2] ASNER | 00 | CLE2 | $10.6\ e^+e^- \to \tau^+\tau^-$, $\tau^- \to \pi^-\pi^0\pi^0\nu_\tau$ |

[1] From a fit to the Dalitz plot.
[2] Assuming for $f_0(500)$ ($\sigma$) mass and width of 860 and 880 MeV respectively.

## $\Gamma\big(f_0(500)\pi,\ f_0 \to \pi\pi\big)/\big[\Gamma\big((\rho\pi)_{S-\text{wave}},\ \rho \to \pi\pi\big) + \Gamma\big((\rho\pi)_{S-\text{wave}},\ \rho \to \pi\pi\big)\big]$ — $\Gamma_6/(\Gamma_2+\Gamma_2)$

| VALUE | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| $0.06 \pm 0.05$ | 90k | SALVINI | 04 | OBLX | $\overline{p}p \to 2\pi^+2\pi^-$ |
| $\sim 0.3$ | 28k | AKHMETSHIN | 99E | CMD2 | $1.05$–$1.38\ e^+e^- \to \pi^+\pi^-\pi^+\pi^-$ |
| $0.003 \pm 0.003$ | | [1] LONGACRE | 82 | RVUE | |

[1] Uses multichannel Aitchison-Bowler model (BOWLER 75). Uses data from GAVILLET 77, DAUM 80, and DANKOWYCH 81.

## $\Gamma\big(f_0(980)\pi,\ f_0 \to \pi\pi\big)/\Gamma_{\text{total}}$ — $\Gamma_7/\Gamma$

| VALUE | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **seen** | | [1] ALEXEEV | 21 | COMP | $\pi^- p \to \pi^-\pi^+\pi^- p$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| not seen | 37k | ASNER | 00 | CLE2 | $10.6\ e^+e^- \to \tau^+\tau^-$, $\tau^- \to \pi^-\pi^0\pi^0\nu_\tau$ |

[1] The $a_1(1260)^- \to f_0(980)\pi^-$ decay mode via the Triangle Singularity mechanism from MIKHASENKO 15 and ACETI 16 explains the $a_1(1420)^-$ signal observed by ADOLPH 15C.

## $\Gamma\big(f_0(1370)\pi,\ f_0 \to \pi\pi\big)/\Gamma_{\text{total}}$ — $\Gamma_8/\Gamma$

| VALUE (units $10^{-2}$) | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| $7.40 \pm 2.71 \pm 1.26$ | 37k | [1,2] ASNER | 00 | CLE2 | $10.6\ e^+e^- \to \tau^+\tau^-$, $\tau^- \to \pi^-\pi^0\pi^0\nu_\tau$ |

[1] From a fit to the Dalitz plot.
[2] Assuming for $f_0(1370)$ mass and width of 1186 and 350 MeV respectively.

### $\Gamma(f_2(1270)\pi,\ f_2 \to \pi\pi)/\Gamma_{total}$ — $\Gamma_9/\Gamma$

| VALUE (units $10^{-2}$) | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| $1.19 \pm 0.49 \pm 0.17$ | 37k | [1,2] ASNER | 00 | CLE2 | $10.6\ e^+e^- \to \tau^+\tau^-$, $\tau^- \to \pi^-\pi^0\pi^0\nu_\tau$ |

[1] From a fit to the Dalitz plot.
[2] Assuming for $f_2(1270)$ mass and width of 1275 and 185 MeV respectively.

### $\Gamma(\pi^+\pi^-\pi^0)/\Gamma_{total}$ — $\Gamma_{10}/\Gamma$

| VALUE | DOCUMENT ID | | COMMENT |
|---|---|---|---|
| **seen** | BARBERIS | 98B | $450\ pp \to p_f \pi^+\pi^-\pi^0 p_s$ |

### $\Gamma(\pi^0\pi^0\pi^0)/\Gamma(\pi^+\pi^-\pi^0)$ — $\Gamma_{11}/\Gamma_{10}$

| VALUE | CL% | DOCUMENT ID | | COMMENT |
|---|---|---|---|---|
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | |
| $<0.008$ | 90 | [1] BARBERIS | 01 | $450\ pp \to p_f 3\pi^0 p_s$ |

[1] Inconsistent with observations of $\sigma\pi$, $f_0(1370)\pi$, and $f_2(1270)\pi$ decay modes.

### $\Gamma(K^*(892)K)/\Gamma_{total}$ — $\Gamma_{13}/\Gamma$

| VALUE (units $10^{-2}$) | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| $2.2 \pm 0.5$ | 2255 | [1] COAN | 04 | CLEO | $\tau^- \to K^-\pi^-K^+\nu_\tau$ |
| 8 to 15 | 205 | [2] DRUTSKOY | 02 | BELL | $B \to D^{(*)}K^-K^{*0}$ |
| $3.3 \pm 0.5 \pm 0.1$ | 37k | [3] ASNER | 00 | CLE2 | $10.6\ e^+e^- \to \tau^+\tau^-$, $\tau^- \to \pi^-\pi^0\pi^0\nu_\tau$ |
| $2.6 \pm 0.3$ | | [4] BARATE | 99R | ALEP | $\tau \to K\overline{K}\pi\nu_\tau$ |

[1] Using structure functions from KUHN 92 and DECKER 93A and B($\tau^- \to K^-\pi^-K^+\nu_\tau$) = $(0.155 \pm 0.006 \pm 0.009)$% from BRIERE 03.
[2] From a comparison to ALAM 94 assuming purely resonant production of the $K^-K^{*0}$ system.
[3] From a fit to the $3\pi$ mass spectrum including the $K\overline{K}^*(892)$ threshold.
[4] Assuming $a_1(1260)$ dominance and taking B($\tau \to a_1(1260)\nu_\tau$) from BUSKULIC 96.

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