NODE=M037

# $\eta(1295)$

$I^G(J^{PC}) = 0^+(0^{-+})$

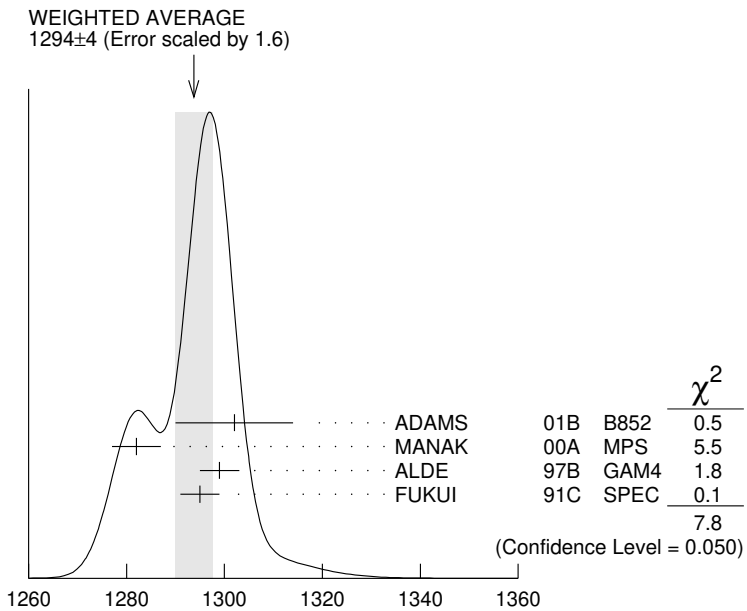
See the review on "Spectroscopy of Light Meson Resonances."

NODE=M037

## $\eta(1295)$ MASS

NODE=M037M

| VALUE (MeV) | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **1294±4 OUR AVERAGE** | | Error includes scale factor of 1.6. See the ideogram below. | | | |
| 1302±9±8 | 20k | ADAMS | 01B | B852 | 18 GeV $\pi^- p \to K^+ K^- \pi^0 n$ |
| 1282±5 | 9082 | MANAK | 00A | MPS | 18 $\pi^- p \to \eta\pi^+\pi^- n$ |
| 1299±4 | 2100 | ALDE | 97B | GAM4 | 100 $\pi^- p \to \eta\pi^0\pi^0 n$ |
| 1295±4 | | FUKUI | 91C | SPEC | 8.95 $\pi^- p \to \eta\pi^+\pi^- n$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| 1264±8 | | [1] AUGUSTIN | 90 | DM2 | $J/\psi \to \gamma\eta\pi^+\pi^-$ |
| ∼ 1275 | | STANTON | 79 | CNTR | 8.4 $\pi^- p \to n\eta 2\pi$ |




[1] PWA analysis of AUGUSTIN 92 assigns $0^{-+}$ quantum numbers to this state rather than $1^{++}$ as before.

NODE=M037M;LINKAGE=AG

## $\eta(1295)$ WIDTH

NODE=M037W

| VALUE (MeV) | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **55± 5 OUR AVERAGE** | | | | | |
| 57±23±21 | 20k | ADAMS | 01B | B852 | 18 GeV $\pi^- p \to K^+ K^- \pi^0 n$ |
| 66±13 | 9082 | MANAK | 00A | MPS | 18 $\pi^- p \to \eta\pi^+\pi^- n$ |
| 53± 6 | | FUKUI | 91C | SPEC | 8.95 $\pi^- p \to \eta\pi^+\pi^- n$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| <40 | 2100 | ALDE | 97B | GAM4 | 100 $\pi^- p \to \eta\pi^0\pi^0 n$ |
| 44±20 | | [1] AUGUSTIN | 90 | DM2 | $J/\psi \to \gamma\eta\pi^+\pi^-$ |
| ∼ 70 | | STANTON | 79 | CNTR | 8.4 $\pi^- p \to n\eta 2\pi$ |

[1] PWA analysis of AUGUSTIN 92 assigns $0^{-+}$ quantum numbers to this state rather than $1^{++}$ as before.

NODE=M037W;LINKAGE=AG

## $\eta(1295)$ DECAY MODES

NODE=M037215;NODE=M037

| | Mode | Fraction ($\Gamma_i/\Gamma$) | |
|---|---|---|---|
| $\Gamma_1$ | $\eta\pi^+\pi^-$ | seen | DESIG=2;OUR EST;→ UNCHECKED ← |
| $\Gamma_2$ | $a_0(980)\pi$ | seen | DESIG=1;OUR EST;→ UNCHECKED ← |
| $\Gamma_3$ | $\gamma\gamma$ | | DESIG=3 |
| $\Gamma_4$ | $\eta\pi^0\pi^0$ | seen | DESIG=4;OUR EST;→ UNCHECKED ← |
| $\Gamma_5$ | $\eta(\pi\pi)_S$-wave | seen | DESIG=5;OUR EST;→ UNCHECKED ← |
| $\Gamma_6$ | $\sigma\eta$ | seen | DESIG=6;OUR EST;→ UNCHECKED ← |
| $\Gamma_7$ | $K\overline{K}\pi$ | seen | DESIG=7;OUR EST;→ UNCHECKED ← |

## $\eta(1295)$ $\Gamma(i)\Gamma(\gamma\gamma)/\Gamma(\text{total})$

NODE=M037220

### $\Gamma(\eta\pi^+\pi^-) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ — $\Gamma_1\Gamma_3/\Gamma$

NODE=M037G2
NODE=M037G2

| VALUE (keV) | CL% | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **<0.066** | 95 | ACCIARRI | 01G | L3 | 183–202 $e^+e^- \to e^+e^-\eta\pi^+\pi^-$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| <0.6 | 90 | AIHARA | 88C | TPC | $e^+e^- \to e^+e^-\eta\pi^+\pi^-$ |
| <0.3 | | ANTREASYAN | 87 | CBAL | $e^+e^- \to e^+e^-\eta\pi\pi$ |

### $\Gamma(K\overline{K}\pi) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ — $\Gamma_7\Gamma_3/\Gamma$

NODE=M037G3
NODE=M037G3

| VALUE (keV) | CL% | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| <0.014 | 90 | [1,2] AHOHE | 05 | CLE2 | 10.6 $e^+e^- \to e^+e^-K^0_S K^\pm\pi^\mp$ |

[1] Using $\eta(1295)$ mass and width 1294 MeV and 55 MeV, respectively. NODE=M037G3;LINKAGE=AH
[2] Assuming three-body phase-space decay to $K^0_S K^\pm\pi^\mp$. NODE=M037G3;LINKAGE=B3

## $\eta(1295)$ BRANCHING RATIOS

NODE=M037225

### $\Gamma(a_0(980)\pi)/\Gamma_{\text{total}}$ — $\Gamma_2/\Gamma$

NODE=M037R1
NODE=M037R1

| VALUE | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | |
| not seen | BERTIN | 97 | OBLX | 0.0 $\overline{p}p \to K^\pm(K^0)\pi^\mp\pi^+\pi^-$ |
| seen | BIRMAN | 88 | MPS | 8 $\pi^-p \to K^+\overline{K}^0\pi^-n$ |
| large | ANDO | 86 | SPEC | 8 $\pi^-p \to \eta\pi^+\pi^-n$ |
| large | STANTON | 79 | CNTR | 8.4 $\pi^-p \to n\eta 2\pi$ |

### $\Gamma(a_0(980)\pi)/\Gamma(\eta\pi^0\pi^0)$ — $\Gamma_2/\Gamma_4$

NODE=M037R2
NODE=M037R2

| VALUE | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|
| **0.65±0.10** | [1] ALDE | 97B | GAM4 | 100 $\pi^-p \to \eta\pi^0\pi^0n$ |

[1] Assuming that $a_0(980)$ decays only to $\eta\pi$. NODE=M037R2;LINKAGE=A

### $\Gamma(\eta(\pi\pi)_S\text{-wave})/\Gamma(\eta\pi^0\pi^0)$ — $\Gamma_5/\Gamma_4$

NODE=M037R4
NODE=M037R4

| VALUE | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|
| **0.35±0.10** | ALDE | 97B | GAM4 | 100 $\pi^-p \to \eta\pi^0\pi^0n$ |

### $\Gamma(a_0(980)\pi)/\Gamma(\sigma\eta)$ — $\Gamma_2/\Gamma_6$

NODE=M037R5
NODE=M037R5

| VALUE | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **0.48±0.22** | 9082 | MANAK | 00A | MPS | 18 $\pi^-p \to \eta\pi^+\pi^-n$ |

## $\eta(1295)$ REFERENCES

NODE=M037


| | | | | | |
|---|---|---|---|---|---|
| AHOHE | 05 | PR D71 072001 | R. Ahohe *et al.* | (CLEO Collab.) | REFID=50764 |
| ACCIARRI | 01G | PL B501 1 | M. Acciarri *et al.* | (L3 Collab.) | REFID=48319 |
| ADAMS | 01B | PL B516 264 | G.S. Adams *et al.* | (BNL E852 Collab.) | REFID=49649 |
| MANAK | 00A | PR D62 012003 | J.J. Manak *et al.* | (BNL E852 Collab.) | REFID=47989 |
| ALDE | 97B | PAN 60 386 | D. Alde *et al.* | (GAMS Collab.) | REFID=45396 |
| | | Translated from YAF 60 458. | | | |
| BERTIN | 97 | PL B400 226 | A. Bertin *et al.* | (OBELIX Collab.) | REFID=45417 |
| AUGUSTIN | 92 | PR D46 1951 | J.E. Augustin, G. Cosme | (DM2 Collab.) | REFID=41584 |
| FUKUI | 91C | PL B267 293 | S. Fukui *et al.* | (SUGI, NAGO, KEK, KYOT+) | REFID=41748 |
| AUGUSTIN | 90 | PR D42 10 | J.E. Augustin *et al.* | (DM2 Collab.) | REFID=41352 |
| AIHARA | 88C | PR D38 1 | H. Aihara *et al.* | (TPC-2$\gamma$ Collab.) | REFID=40564 |
| BIRMAN | 88 | PRL 61 1557 | A. Birman *et al.* | (BNL, FSU, IND, MASD) JP | REFID=40568 |
| ANTREASYAN | 87 | PR D36 2633 | D. Antreasyan *et al.* | (Crystal Ball Collab.) | REFID=40008 |
| ANDO | 86 | PRL 57 1296 | A. Ando *et al.* | (KEK, KYOT, NIRS, SAGA+) IJP | REFID=20891 |
| STANTON | 79 | PRL 42 346 | N.R. Stanton *et al.* | (OSU, CARL, MCGI+) JP | REFID=20887 |