

$\pi_1(1400)$

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

See the review on "Non- $q\bar{q}$ Mesons" and a note in PDG 06, Journal of Physics **G33** 1 (2006).

$\pi_1(1400)$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
1354 ±25	OUR AVERAGE	Error includes scale factor of 1.8. See the ideogram below.			
1257 ±20 ±25	23.5k	ADAMS	07B	B852	18 $\pi^- p \rightarrow \eta \pi^0 n$
1384 ±20 ±35	90k	SALVINI	04	OBLX	$\bar{p} p \rightarrow 2\pi^+ 2\pi^-$
1360 ±25		ABELE	99	CBAR	0.0 $\bar{p} p \rightarrow \pi^0 \pi^0 \eta$
1400 ±20 ±20		ABELE	98B	CBAR	0.0 $\bar{p} n \rightarrow \pi^- \pi^0 \eta$
1370 ±16 ⁺⁵⁰ / ₋₃₀		¹ THOMPSON	97	MPS	18 $\pi^- p \rightarrow \eta \pi^- p$

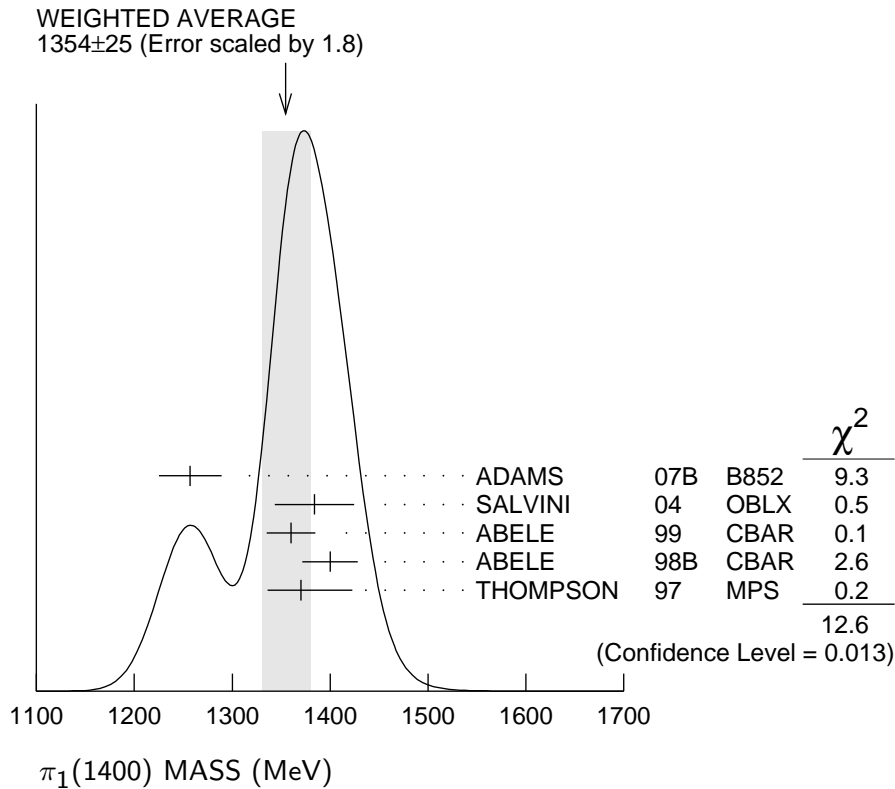
• • • We do not use the following data for averages, fits, limits, etc. • • •

1323.1 ± 4.6		² AOYAGI	93	BKEI	$\pi^- p \rightarrow \eta \pi^- p$
1406 ±20		³ ALDE	88B	GAM4 0	100 $\pi^- p \rightarrow \eta \pi^0 n$

¹ Natural parity exchange, questioned by DZIERBA 03.

² Unnatural parity exchange.

³ Seen in the P_0 -wave intensity of the $\eta \pi^0$ system, unnatural parity exchange.



$\pi_1(1400)$ WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
330 ± 35	OUR AVERAGE				
354 ± 64 ± 58	23.5k	ADAMS	07B	B852	18 $\pi^- p \rightarrow \eta \pi^0 n$
378 ± 50 ± 50	90k	SALVINI	04	OBLX	$\bar{p} p \rightarrow 2\pi^+ 2\pi^-$
220 ± 90		ABELE	99	CBAR	0.0 $\bar{p} p \rightarrow \pi^0 \pi^0 \eta$
310 ± 50 $\begin{smallmatrix} + 50 \\ - 30 \end{smallmatrix}$		ABELE	98B	CBAR	0.0 $\bar{p} n \rightarrow \pi^- \pi^0 \eta$
385 ± 40 $\begin{smallmatrix} + 65 \\ - 105 \end{smallmatrix}$		⁴ THOMPSON	97	MPS	18 $\pi^- p \rightarrow \eta \pi^- p$

• • • We do not use the following data for averages, fits, limits, etc. • • •

143.2 ± 12.5		⁵ AOYAGI	93	BKEI	$\pi^- p \rightarrow \eta \pi^- p$
180 ± 20		⁶ ALDE	88B	GAM4 0	100 $\pi^- p \rightarrow \eta \pi^0 n$

⁴ Resolution is not unfolded, natural parity exchange, questioned by DZIERBA 03.

⁵ Unnatural parity exchange.

⁶ Seen in the P_0 -wave intensity of the $\eta \pi^0$ system, unnatural parity exchange.

$\pi_1(1400)$ DECAY MODES

Mode	Fraction (Γ_i/Γ)
Γ_1 $\eta \pi^0$	seen
Γ_2 $\eta \pi^-$	seen
Γ_3 $\eta' \pi$	
Γ_4 $\rho(770) \pi$	not seen

$\pi_1(1400)$ BRANCHING RATIOS

$\Gamma(\eta \pi^0)/\Gamma_{\text{total}}$	DOCUMENT ID	TECN	CHG	COMMENT	Γ_1/Γ
not seen	PROKOSHKIN 95B	GAM4		100 $\pi^- p \rightarrow \eta \pi^0 n$	
not seen	⁷ BUGG	94	RVUE	$\bar{p} p \rightarrow \eta 2\pi^0$	
not seen	⁸ APEL	81	NICE 0	40 $\pi^- p \rightarrow \eta \pi^0 n$	

⁷ Using Crystal Barrel data.

⁸ A general fit allowing S , D , and P waves (including $m=0$) is not done because of limited statistics.

$\Gamma(\eta \pi^-)/\Gamma_{\text{total}}$	DOCUMENT ID	TECN	COMMENT	Γ_2/Γ
possibly seen	BELADIDZE 93	VES	$37 \pi^- N \rightarrow \eta \pi^- N$	

$\Gamma(\eta'\pi)/\Gamma(\eta\pi^0)$

Γ_3/Γ_1

VALUE CL% DOCUMENT ID TECN COMMENT

• • • We do not use the following data for averages, fits, limits, etc. • • •

<0.80 95 BOUTEMEUR 90 GAM4 100 $\pi^- p \rightarrow 4\gamma n$

$\Gamma(\rho(770)\pi)/\Gamma_{\text{total}}$

Γ_4/Γ

VALUE DOCUMENT ID TECN COMMENT

not seen AGHASYAN 18B COMP 190 $\pi^- p \rightarrow \pi^- \pi^+ \pi^- p$

$\pi_1(1400)$ REFERENCES

AGHASYAN	18B	PR D98 092003	M. Aghasyan <i>et al.</i>	(COMPASS Collab.)
ADAMS	07B	PL B657 27	G.S. Adams <i>et al.</i>	(BNL E852 Collab.)
PDG	06	JP G33 1	W.-M. Yao <i>et al.</i>	(PDG Collab.)
SALVINI	04	EPJ C35 21	P. Salvini <i>et al.</i>	(OBELIX Collab.)
DZIERBA	03	PR D67 094015	A.R. Dzierba <i>et al.</i>	
ABELE	99	PL B446 349	A. Abele <i>et al.</i>	(Crystal Barrel Collab.)
ABELE	98B	PL B423 175	A. Abele <i>et al.</i>	(Crystal Barrel Collab.)
THOMPSON	97	PRL 79 1630	D.R. Thompson <i>et al.</i>	(BNL E852 Collab.)
PROKOSHKIN	95B	PAN 58 606	Y.D. Prokoshkin, S.A. Sadovsky	(SERP)
		Translated from YAF 58 662.		
BUGG	94	PR D50 4412	D.V. Bugg <i>et al.</i>	(LOQM)
AOYAGI	93	PL B314 246	H. Aoyagi <i>et al.</i>	(BKEI Collab.)
BELADIDZE	93	PL B313 276	G.M. Beladidze <i>et al.</i>	(VES Collab.)
BOUTEMEUR	90	Hadron 89 Conf. p 119	M. Boutemeur, M. Poulet	(SERP, BELG, LANL+)
ALDE	88B	PL B205 397	D.M. Alde <i>et al.</i>	(SERP, BELG, LANL, LAPP) IGJPC
APEL	81	NP B193 269	W.D. Apel <i>et al.</i>	(SERP, CERN)