$\pi(1800)$

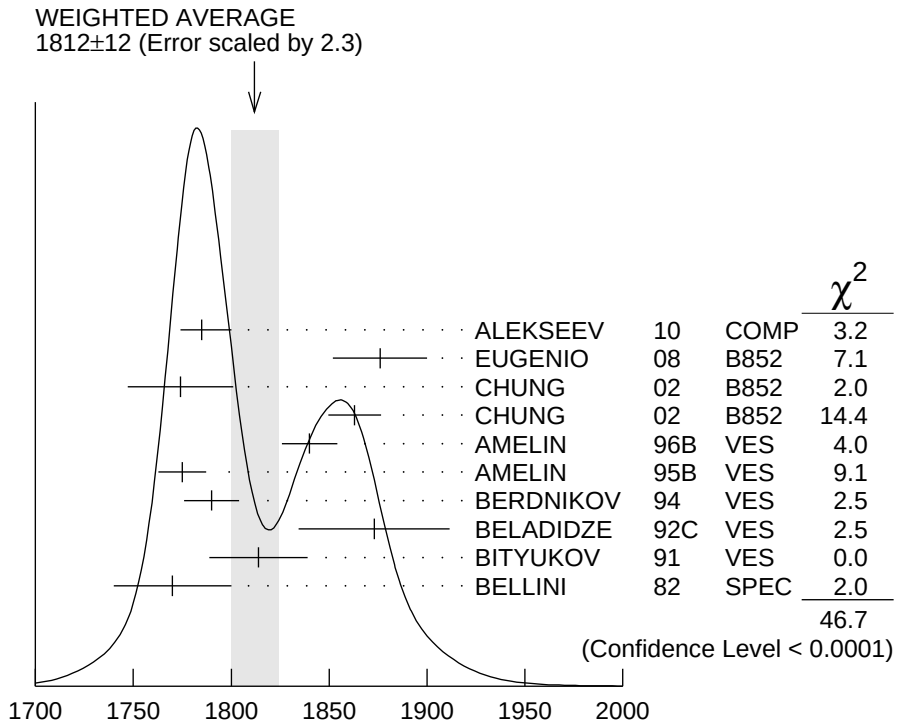
$I^G(J^{PC}) = 1^-(0^{-+})$

See also minireview under non-$q\overline{q}$ candidates in PDG 06, Journal of Physics, G **33** 1 (2006).

$\pi(1800)$ MASS

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
1812±12 OUR AVERAGE		Error includes scale factor of 2.3. See the ideogram below.				
$1785 \pm 9^{+12}_{-6}$	420k	ALEKSEEV	10	COMP		190 $\pi^- Pb \rightarrow \pi^-\pi^-\pi^+ Pb'$
1876±18±16	4k	[1] EUGENIO	08	B852	–	18 $\pi^- p \rightarrow \eta\eta\pi^- p$
1774±18±20		[2] CHUNG	02	B852		18.3 $\pi^- p \rightarrow \pi^+\pi^-\pi^- p$
1863± 9±10		[3] CHUNG	02	B852		18.3 $\pi^- p \rightarrow \pi^+\pi^-\pi^- p$
1840±10±10	1200	AMELIN	96B	VES	–	37 $\pi^- A \rightarrow \eta\eta\pi^- A$
1775± 7±10		[4] AMELIN	95B	VES	–	36 $\pi^- A \rightarrow \pi^+\pi^-\pi^- A$
1790±14		[5] BERDNIKOV	94	VES	–	37 $\pi^- A \rightarrow K^+K^-\pi^- A$
1873±33±20		BELADIDZE	92C	VES	–	36 π^- Be $\rightarrow \pi^-\eta'\eta$ Be
1814±10±23	426 ± 57	BITYUKOV	91	VES	–	36 π^- C $\rightarrow \pi^-\eta\eta$ C
1770±30	1100	BELLINI	82	SPEC	–	40 π^- A $\rightarrow 3\pi$ A
• • • We do not use the following data for averages, fits, limits, etc. • • •						
1737± 5±15		AMELIN	99	VES		37 $\pi^- A \rightarrow \omega\pi^-\pi^0 A^*$

[1] From a single-pole fit.
[2] In the $f_0(980)\pi$ wave.
[3] In the $f_0(500)\pi$ wave.
[4] From a fit to $J^{PC} = 0^{-+}$ $f_0(980)\pi$, $f_0(1370)\pi$ waves.
[5] From a fit to $J^{PC} = 0^{-+}$ $K_0^*(1430)K^-$ and $f_0(980)\pi^-$ waves.



π(1800) WIDTH

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
208±12 OUR AVERAGE						
$208 \pm 22^{+21}_{-37}$	420k	ALEKSEEV	10	COMP		190 $\pi^- Pb \rightarrow \pi^-\pi^-\pi^+ Pb'$
221±26±38	4k	[6] EUGENIO	08	B852	–	18 $\pi^- p \rightarrow \eta\eta\pi^- p$
223±48±50		[7] CHUNG	02	B852		18.3 $\pi^- p \rightarrow \pi^+\pi^-\pi^- p$
191±21±20		[8] CHUNG	02	B852		18.3 $\pi^- p \rightarrow \pi^+\pi^-\pi^- p$
210±30±30	1200	AMELIN	96B	VES	–	37 $\pi^- A \rightarrow \eta\eta\pi^- A$
190±15±15		[9] AMELIN	95B	VES	–	36 $\pi^- A \rightarrow \pi^+\pi^-\pi^- A$
210±70		[10] BERDNIKOV	94	VES	–	37 $\pi^- A \rightarrow K^+K^-\pi^- A$
225±35±20		BELADIDZE	92C	VES	–	36 π^- Be $\rightarrow \pi^-\eta'\eta$ Be
205±18±32	426 ± 57	BITYUKOV	91	VES	–	36 π^- C $\rightarrow \pi^-\eta\eta$ C
310±50	1100	BELLINI	82	SPEC	–	40 π^- A $\rightarrow 3\pi$ A
• • • We do not use the following data for averages, fits, limits, etc. • • •						
259±19± 6		AMELIN	99	VES		37 $\pi^- A \rightarrow \omega\pi^-\pi^0 A^*$

[6] From a single-pole fit.
[7] In the $f_0(980)\pi$ wave.
[8] In the $f_0(500)\pi$ wave.
[9] From a fit to $J^{PC} = 0^{-+}$ $f_0(980)\pi$, $f_0(1370)\pi$ waves.
[10] From a fit to $J^{PC} = 0^{-+}$ $K_0^*(1430)K^-$ and $f_0(980)\pi^-$ waves.

$\pi(1800)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)
Γ_1	$\pi^+\pi^-\pi^-$	seen
Γ_2	$f_0(500)\pi^-$	seen
Γ_3	$f_0(980)\pi^-$	seen
Γ_4	$f_0(1370)\pi^-$	seen
Γ_5	$f_0(1500)\pi^-$	not seen
Γ_6	$\rho\pi^-$	not seen
Γ_7	$\eta\eta\pi^-$	seen
Γ_8	$a_0(980)\eta$	seen
Γ_9	$a_2(1320)\eta$	not seen
Γ_{10}	$f_2(1270)\pi$	not seen
Γ_{11}	$f_0(1370)\pi^-$	not seen
Γ_{12}	$f_0(1500)\pi^-$	seen
Γ_{13}	$\eta\eta'(958)\pi^-$	seen
Γ_{14}	$K_0^*(1430)K^-$	seen
Γ_{15}	$K^*(892)K^-$	not seen

$\pi(1800)$ BRANCHING RATIOS

$\Gamma(f_0(980)\pi^-)/\Gamma(f_0(500)\pi^-)$ Γ_3/Γ_2

VALUE		DOCUMENT ID		TECN	COMMENT
0.44±0.08±0.38	[11]	CHUNG	02	B852	18.3 $\pi^- p \to \pi^+\pi^-\pi^- p$

$\Gamma(f_0(980)\pi^-)/\Gamma(f_0(1370)\pi^-)$ Γ_3/Γ_4

VALUE	DOCUMENT ID		TECN	CHG	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1.7±1.3	[12] AMELIN	95B	VES	–	36 $\pi^- A \to \pi^+\pi^-\pi^- A$

$\Gamma(f_0(1370)\pi^-)/\Gamma_{total}$ Γ_4/Γ

VALUE	DOCUMENT ID		TECN	CHG	COMMENT
seen	BELLINI	82	SPEC	–	40 π^- A → 3π A

$\Gamma(f_0(1500)\pi^-)/\Gamma_{total}$ Γ_5/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
not seen	CHUNG	02	B852	18.3 $\pi^- p \to \pi^+\pi^-\pi^- p$

$\Gamma(\rho\pi^-)/\Gamma_{total}$ Γ_6/Γ

VALUE	DOCUMENT ID		TECN	CHG	COMMENT
not seen	BELLINI	82	SPEC	–	40 π^- A → 3π A

$\Gamma(\rho\pi^-)/\Gamma(f_0(980)\pi^-)$ Γ_6/Γ_3

VALUE	CL%	DOCUMENT ID		TECN	CHG	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<0.25		CHUNG	02	B852		18.3 $\pi^- p \to \pi^+\pi^-\pi^- p$
<0.14	90	AMELIN	95B	VES	–	36 $\pi^- A \to \pi^+\pi^-\pi^- A$

$\Gamma(\eta\eta\pi^-)/\Gamma(\pi^+\pi^-\pi^-)$ Γ_7/Γ_1

VALUE	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •						
0.5 ± 0.1	1200	[12] AMELIN	96B	VES	–	37 $\pi^- A \to \eta\eta\pi^- A$

$\Gamma(a_2(1320)\eta)/\Gamma_{total}$ Γ_9/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
not seen	EUGENIO	08	B852	18 $\pi^- p \to \eta\eta\pi^- p$

$\Gamma(f_2(1270)\pi)/\Gamma_{total}$ Γ_{10}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
not seen	EUGENIO	08	B852	18 $\pi^- p \to \eta\eta\pi^- p$

$\Gamma(f_0(1370)\pi^-)/\Gamma_{total}$ Γ_{11}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
not seen	EUGENIO	08	B852	18 $\pi^- p \to \eta\eta\pi^- p$

$\Gamma(f_0(1500)\pi^-)/\Gamma(a_0(980)\eta)$ Γ_{12}/Γ_8

VALUE	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$0.48\ \pm0.17$	4k	[12,13] EUGENIO	08	B852	–	18 $\pi^- p \to \eta\eta\pi^- p$
$0.030^{+0.014}_{-0.011}$		[12] ANISOVICH	01B	SPEC	0	0.6–1.94 $p\overline{p} \to \eta\eta\pi^0\pi^0$
$0.08\ \pm0.03$	1200	[12,14] AMELIN	96B	VES	–	37 $\pi^- A \to \eta\eta\pi^- A$

$\Gamma(\eta\eta'(958)\pi^-)/\Gamma(\eta\eta\pi^-)$ Γ_{13}/Γ_7

VALUE	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •						
0.29 ± 0.07		[12] BELADIDZE	92C	VES	–	36 π^- Be $\to \pi^-\eta'\eta$ Be
$0.3\ \pm0.1$	426 ± 57	[12] BITYUKOV	91	VES	–	36 π^- C $\to \pi^-\eta\eta$ C

$\Gamma(K_0^*(1430)K^-)/\Gamma_{total}$ Γ_{14}/Γ

VALUE	DOCUMENT ID		TECN	CHG	COMMENT
seen	BERDNIKOV	94	VES	–	37 $\pi^- A \to K^+ K^- \pi^- A$

$\Gamma(K^*(892)K^-)/\Gamma_{total}$ Γ_{15}/Γ

VALUE	DOCUMENT ID		TECN	CHG	COMMENT
not seen	BERDNIKOV	94	VES	–	37 $\pi^- A \to K^+ K^- \pi^- A$

[11] Assuming that $f_0(980)$ decays only to $\pi\pi$.
[12] Systematic errors not estimated.
[13] From a single-pole fit.
[14] Assuming that $f_0(1500)$ decays only to $\eta\eta$ and $a_0(980)$ decays only to $\eta\pi$.

π(1800) REFERENCES

ALEKSEEV	10	PRL 104 241803	M.G. Alekseev *et al.*	(COMPASS Collab.)
EUGENIO	08	PL B660 466	P. Eugenio *et al.*	(BNL E852 Collab.)
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CHUNG	02	PR D65 072001	S.U. Chung *et al.*	(BNL E852 Collab.)
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AMELIN	99	PAN 62 445	D.V. Amelin *et al.*	(VES Collab.)
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		Translated from YAF 59 1021.		
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BELADIDZE	92C	SJNP 55 1535	G.M. Beladidze, S.I. Bityukov, G.V. Borisov	(SERP+)
		Translated from YAF 55 2748.		
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BELLINI	82	PRL 48 1697	G. Bellini *et al.*	(MILA, BGNA, JINR)