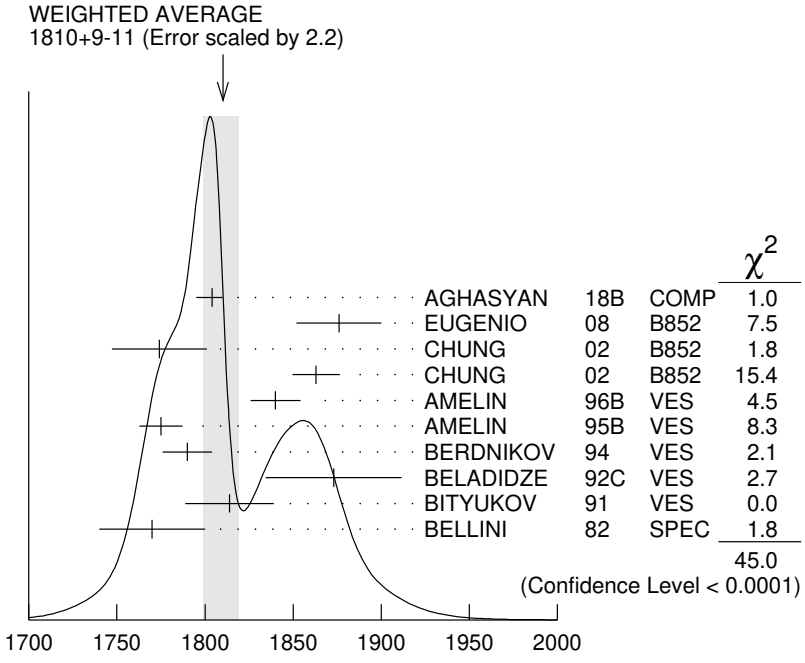
$\pi(1800)$

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

See the review on "Non-$q\overline{q}$ Mesons."

$\pi(1800)$ MASS

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
1810^{+9}_{-11} OUR AVERAGE		Error includes scale factor of 2.2. See the ideogram below.				
1804^{+6}_{-9}	46M	[1] AGHASYAN	18B	COMP		190 $\pi^- p \to \pi^-\pi^+\pi^- p$
$1876\pm18\pm16$	4k	[2] EUGENIO	08	B852	–	18 $\pi^- p \to \eta\eta\pi^- p$
$1774\pm18\pm20$		[3] CHUNG	02	B852		18.3 $\pi^- p \to \pi^+\pi^-\pi^- p$
$1863\pm 9\pm10$		[4] CHUNG	02	B852		18.3 $\pi^- p \to \pi^+\pi^-\pi^- p$
$1840\pm10\pm10$	1.2k	AMELIN	96B	VES	–	37 $\pi^- A \to \eta\eta\pi^- A$
$1775\pm 7\pm10$		[5] AMELIN	95B	VES	–	36 $\pi^- A \to \pi^+\pi^-\pi^- A$
1790 ± 14		[6] BERDNIKOV	94	VES	–	37 $\pi^- A \to K^+K^-\pi^- A$
$1873\pm33\pm20$		BELADIDZE	92C	VES	–	36 π^- Be $\to \pi^-\eta'\eta$ Be
$1814\pm10\pm23$	426	BITYUKOV	91	VES	–	36 π^- C $\to \pi^-\eta\eta$ C
1770 ± 30	1.1k	BELLINI	82	SPEC	–	40 π^- A $\to 3\pi$ A
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$1785\pm 9^{+12}_{-6}$	420k	[7] ALEKSEEV	10	COMP		190 $\pi^- Pb \to \pi^-\pi^-\pi^+ Pb'$
$1737\pm 5\pm15$		AMELIN	99	VES		37 $\pi^- A \to \omega\pi^-\pi^0 A^*$



[1] Statistical error negligible.

[2] From a single-pole fit.
[3] In the $f_0(980)\pi$ wave.
[4] In the $f_0(500)\pi$ wave.
[5] From a fit to $J^{PC} = 0^{-+}$ $f_0(980)\pi$, $f_0(1370)\pi$ waves.
[6] From a fit to $J^{PC} = 0^{-+}$ $K_0^*(1430)K^-$ and $f_0(980)\pi^-$ waves.
[7] Superseded by AGHASYAN 2018B.

$\pi(1800)$ WIDTH

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
$215^{+\ 7}_{=\ 8}$ OUR AVERAGE						
$220^{+\ 8}_{-11}$	46M	[8] AGHASYAN	18B	COMP		190 $\pi^- p \to\ \pi^-\pi^+\pi^- p$
$221\pm26\pm38$	4k	[9] EUGENIO	08	B852	–	18 $\pi^- p \to\ \eta\eta\pi^- p$
$223\pm48\pm50$		[10] CHUNG	02	B852		18.3 $\pi^- p \to$ $\pi^+\pi^-\pi^- p$
$191\pm21\pm20$		[11] CHUNG	02	B852		18.3 $\pi^- p \to$ $\pi^+\pi^-\pi^- p$
$210\pm30\pm30$	1.2k	AMELIN	96B	VES	–	37 $\pi^- A \to\ \eta\eta\pi^- A$
$190\pm15\pm15$		[12] AMELIN	95B	VES	–	36 $\pi^- A \to\ \pi^+\pi^-\pi^- A$
210 ± 70		[13] BERDNIKOV	94	VES	–	37 $\pi^- A \to\ K^+K^-\pi^- A$
$225\pm35\pm20$		BELADIDZE	92C	VES	–	36 π^- Be $\to\ \pi^-\eta'\eta$ Be
$205\pm18\pm32$	426	BITYUKOV	91	VES	–	36 π^- C $\to\ \pi^-\eta\eta$ C
310 ± 50	1.1k	BELLINI	82	SPEC	–	40 π^- A $\to\ 3\pi$ A
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$208\pm22^{+21}_{-37}$	420k	[14] ALEKSEEV	10	COMP		190 $\pi^- Pb \to$ $\pi^-\pi^-\pi^+ Pb'$
$259\pm19\pm\ 6$		AMELIN	99	VES		37 $\pi^- A \to\ \omega\pi^-\pi^0 A^*$

[8] Statistical error negligible.
[9] From a single-pole fit.
[10] In the $f_0(980)\pi$ wave.
[11] In the $f_0(500)\pi$ wave.
[12] From a fit to $J^{PC} = 0^{-+}$ $f_0(980)\pi$, $f_0(1370)\pi$ waves.
[13] From a fit to $J^{PC} = 0^{-+}$ $K_0^*(1430)K^-$ and $f_0(980)\pi^-$ waves.
[14] Superseded by AGHASYAN 2018B.

$\pi(1800)$ 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	[15] 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	[16] 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 $\to$ 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 $\to$ 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	[16] 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 $\pm$0.17	4k	[16,17] EUGENIO	08	B852	–	18 $\pi^- p \to \eta\eta\pi^- p$
$0.030^{+0.014}_{-0.011}$		[16] ANISOVICH	01B	SPEC	0	0.6–1.94 $p\overline{p} \to \eta\eta\pi^0\pi^0$
0.08 $\pm$0.03	1200	[16,18] 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$\pm$0.07		[16] BELADIDZE	92C	VES	–	36 π^- Be $\to \pi^-\eta'\eta$ Be
0.3 $\pm$0.1	426 $\pm$ 57	[16] 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 $\pi^- A \to K^+ K^- \pi^- A$

[15] Assuming that $f_0(980)$ decays only to $\pi\pi$.

[16] Systematic errors not estimated.

[17] From a single-pole fit.

[18] Assuming that $f_0(1500)$ decays only to $\eta\eta$ and $a_0(980)$ decays only to $\eta\pi$.

$\pi(1800)$ REFERENCES

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ANISOVICH	01B	PL B500 222	A.V. Anisovich *et al.*	
AMELIN	99	PAN 62 445	D.V. Amelin *et al.*	(VES Collab.)
		Translated from YAF 62 487.		
AMELIN	96B	PAN 59 976	D.V. Amelin *et al.*	(SERP, TBIL) IGJPC
		Translated from YAF 59 1021.		
AMELIN	95B	PL B356 595	D.V. Amelin *et al.*	(SERP, TBIL)
BERDNIKOV	94	PL B337 219	E.B. Berdnikov *et al.*	(SERP, TBIL)
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)