

π(1800)

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

See the related review on "Non- $q\bar{q}$ mesons."

π(1800) MASS

VALUE (MeV) EVTS DOCUMENT ID TECN CHG COMMENT

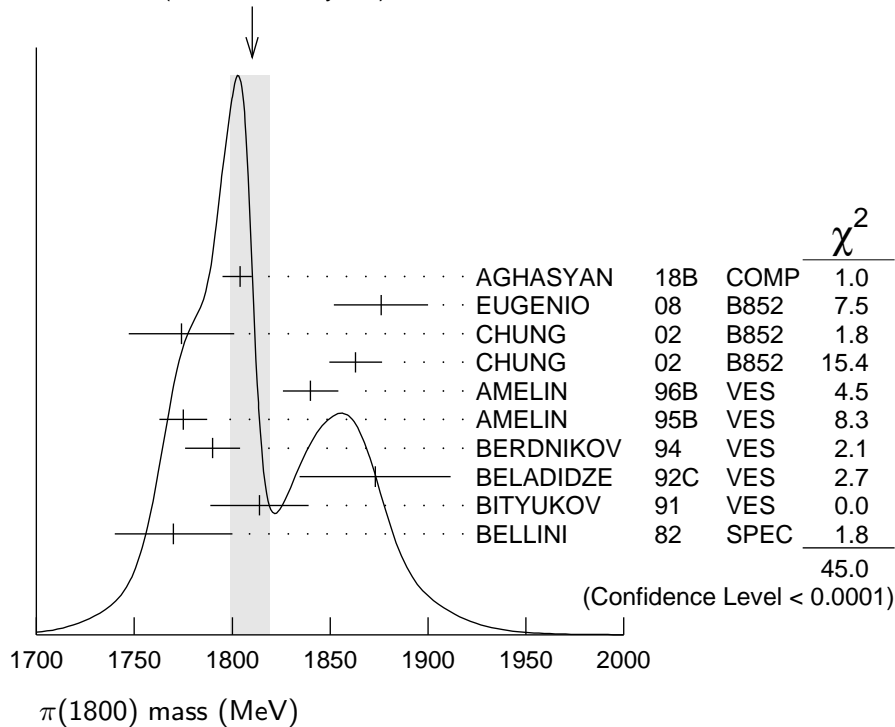
1810⁺⁹₋₁₁ OUR AVERAGE Error includes scale factor of 2.2. See the ideogram below.

1804 ⁺⁶ ₋₉	46M	¹ AGHASYAN	18B	COMP	190	π ⁻ p → π ⁻ π ⁺ π ⁻ p
1876 ± 18 ± 16	4k	² EUGENIO	08	B852	—	18 π ⁻ p → ηηπ ⁻ p
1774 ± 18 ± 20		³ CHUNG	02	B852		18.3 π ⁻ p → π ⁺ π ⁻ π ⁻ p
1863 ± 9 ± 10		⁴ CHUNG	02	B852		18.3 π ⁻ p → π ⁺ π ⁻ π ⁻ p
1840 ± 10 ± 10	1.2k	AMELIN	96B	VES	—	37 π ⁻ A → ηηπ ⁻ A
1775 ± 7 ± 10		⁵ AMELIN	95B	VES	—	36 π ⁻ A → π ⁺ π ⁻ π ⁻ A
1790 ± 14		⁶ BERDNIKOV	94	VES	—	37 π ⁻ A → K ⁺ K ⁻ π ⁻ A
1873 ± 33 ± 20		BELADIDZE	92C	VES	—	36 π ⁻ Be → π ⁻ η' η Be
1814 ± 10 ± 23	426	BITYUKOV	91	VES	—	36 π ⁻ C → π ⁻ ηη C
1770 ± 30	1.1k	BELLINI	82	SPEC	—	40 π ⁻ A → 3π A

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

1785 ± 9 ⁺¹² ₋₆	420k	⁷ ALEKSEEV	10	COMP	190	π ⁻ Pb → π ⁻ π ⁻ π ⁺ Pb'
1737 ± 5 ± 15		AMELIN	99	VES	37	π ⁻ A → ω π ⁻ π ⁰ A*

WEIGHTED AVERAGE
1810+9-11 (Error scaled by 2.2)



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⁷ Superseded by AGHASYAN 2018B.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
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215⁺⁸₋₁₁ OUR AVERAGE

220 ⁺⁸ ₋₁₁	46M	⁸ AGHASYAN	18B	COMP	190 $\pi^- p \rightarrow \pi^- \pi^+ \pi^- p$
221 ± 26 ± 38	4k	⁹ EUGENIO	08	B852	− 18 $\pi^- p \rightarrow \eta \eta \pi^- p$
223 ± 48 ± 50		¹⁰ CHUNG	02	B852	18.3 $\pi^- p \rightarrow \pi^+ \pi^- \pi^- p$
191 ± 21 ± 20		¹¹ CHUNG	02	B852	18.3 $\pi^- p \rightarrow \pi^+ \pi^- \pi^- p$
210 ± 30 ± 30	1.2k	AMELIN	96B	VES	− 37 $\pi^- A \rightarrow \eta \eta \pi^- A$
190 ± 15 ± 15		¹² AMELIN	95B	VES	− 36 $\pi^- A \rightarrow \pi^+ \pi^- \pi^- A$
210 ± 70		¹³ BERDNIKOV	94	VES	− 37 $\pi^- A \rightarrow K^+ K^- \pi^- A$
225 ± 35 ± 20		BELADIDZE	92C	VES	− 36 $\pi^- \text{Be} \rightarrow \pi^- \eta' \eta \text{Be}$
205 ± 18 ± 32	426	BITYUKOV	91	VES	− 36 $\pi^- \text{C} \rightarrow \pi^- \eta \eta \text{C}$
310 ± 50	1.1k	BELLINI	82	SPEC	− 40 $\pi^- A \rightarrow 3\pi A$

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

208 ± 22 ⁺²¹ ₋₃₇	420k	¹⁴ ALEKSEEV	10	COMP	190 $\pi^- Pb \rightarrow \pi^- \pi^- \pi^+ Pb'$
259 ± 19 ± 6		AMELIN	99	VES	37 $\pi^- A \rightarrow \omega \pi^- \pi^0 A^*$

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

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
0.44±0.08±0.38	¹⁵ CHUNG	02	B852	18.3 $\pi^- p \rightarrow \pi^+ \pi^- \pi^- p$

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

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
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• • • We do not use the following data for averages, fits, limits, etc. • • •

1.7±1.3	¹⁶ AMELIN	95B	VES	–	36 $\pi^- A \rightarrow \pi^+ \pi^- \pi^- A$
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$\Gamma(f_0(1370)\pi^-)/\Gamma_{\text{total}}$ Γ_4/Γ

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
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seen BELLINI 82 SPEC – 40 $\pi^- A \rightarrow 3\pi A$

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

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
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not seen CHUNG 02 B852 18.3 $\pi^- p \rightarrow \pi^+ \pi^- \pi^- p$

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

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
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not seen BELLINI 82 SPEC – 40 $\pi^- A \rightarrow 3\pi A$

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

<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
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• • • We do not use the following data for averages, fits, limits, etc. • • •

<0.25 CHUNG 02 B852 18.3 $\pi^- p \rightarrow \pi^+ \pi^- \pi^- p$

<0.14 90 AMELIN 95B VES – 36 $\pi^- A \rightarrow \pi^+ \pi^- \pi^- A$

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

<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
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• • • We do not use the following data for averages, fits, limits, etc. • • •

0.5±0.1 1200 ¹⁶ AMELIN 96B VES – 37 $\pi^- A \rightarrow \eta\eta\pi^- A$

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

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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not seen EUGENIO 08 B852 18 $\pi^- p \rightarrow \eta\eta\pi^- p$

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

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

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

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

$\Gamma(f_0(1500)\pi^-)/\Gamma(a_0(980)\eta)$ 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 ± 0.17	4k ^{16,17}	EUGENIO 08	B852	–	18 $\pi^- p \rightarrow \eta\eta\pi^- p$
0.030 ^{+0.014} _{–0.011}	¹⁶	ANISOVICH 01B	SPEC	0	0.6–1.94 $p\bar{p} \rightarrow \eta\eta\pi^0\pi^0$
0.08 ± 0.03	1200 ^{16,18}	AMELIN 96B	VES	–	37 $\pi^- A \rightarrow \eta\eta\pi^- A$

$\Gamma(\eta\eta'(958)\pi^-)/\Gamma(\eta\eta\pi^-)$ 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	¹⁶	BELADIDZE 92C	VES	–	36 $\pi^- \text{Be} \rightarrow \pi^- \eta' \eta \text{Be}$
0.3 ± 0.1	426 ± 57 ¹⁶	BITYUKOV 91	VES	–	36 $\pi^- \text{C} \rightarrow \pi^- \eta \eta \text{C}$

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

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

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

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

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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ALEKSEEV 10	PRL 104 241803	M.G. Alekseev <i>et al.</i>	(COMPASS Collab.)
EUGENIO 08	PL B660 466	P. Eugenio <i>et al.</i>	(BNL E852 Collab.)
CHUNG 02	PR D65 072001	S.U. Chung <i>et al.</i>	(BNL E852 Collab.)
ANISOVICH 01B	PL B500 222	A.V. Anisovich <i>et al.</i>	
AMELIN 99	PAN 62 445	D.V. Amelin <i>et al.</i>	(VES Collab.)
	Translated from YAF 62 487.		
AMELIN 96B	PAN 59 976	D.V. Amelin <i>et al.</i>	(SERP, TBIL) IGJPC
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AMELIN 95B	PL B356 595	D.V. Amelin <i>et al.</i>	(SERP, TBIL)
BERDNIKOV 94	PL B337 219	E.B. Berdnikov <i>et al.</i>	(SERP, TBIL)
BELADIDZE 92C	SJNP 55 1535	G.M. Beladidze, S.I. Bityukov, G.V. Borisov	(SERP+)
	Translated from YAF 55 2748.		
BITYUKOV 91	PL B268 137	S.I. Bityukov <i>et al.</i>	(SERP, TBIL)
BELLINI 82	PRL 48 1697	G. Bellini <i>et al.</i>	(MILA, BGNA, JINR)