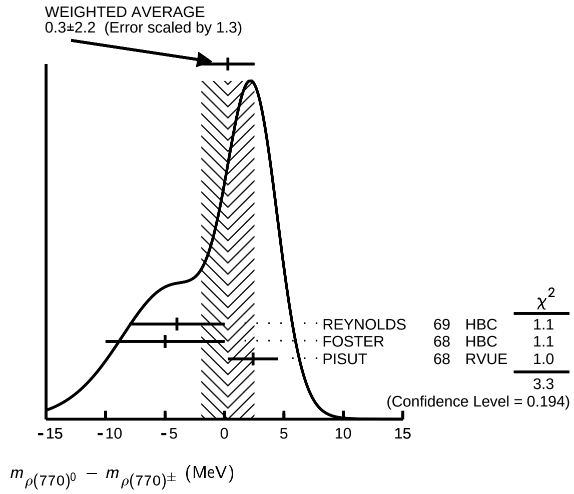
See key on page 1343

[7] Includes MALAMUD 69, ARMENISE 68, BACON 67, HUWE 67, MILLER 67B, ALFF-STEINBERGER 66, HAGOPIAN 66, HAGOPIAN 66B, JACOBS 66B, JAMES 66, WEST 66, GOLDHABER 64, ABOLINS 63.
[8] Includes BARKOV 85 data. Model-dependent width definition.
[9] From fit of 3-parameter relativistic Breit-Wigner to helicity-zero part of P-wave intensity. CHABAUD 83 includes data of GRAYER 74.
[10] HEYN 81 includes all spacelike and timelike F_π values until 1978.

$m_{\rho(770)^0} - m_{\rho(770)^\pm}$

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
0.3±2.2 OUR AVERAGE	Error includes scale factor of 1.3. See the ideogram below.					
−4.0±4.0	3000	[11] REYNOLDS	69	HBC	−0	2.26 $\pi^- p$
−5 ±5	3600	[11] FOSTER	68	HBC	±0	0.0 $\overline{p}p$
2.4±2.1	22950	[12] PISUT	68	RVUE		$\pi N \to \rho N$

[11] From quoted masses of charged and neutral modes.
[12] Includes MALAMUD 69, ARMENISE 68, BATON 68, BACON 67, HUWE 67, MILLER 67B, ALFF-STEINBERGER 66, HAGOPIAN 66, HAGOPIAN 66B, JACOBS 66B, JAMES 66, WEST 66, BLIEDEN 65, CARMONY 64, GOLDHABER 64, ABOLINS 63.



$\rho(770)$ RANGE PARAMETER

The range parameter R enters an energy-dependent correction to the width, of the form $(1 + q_r^2 R^2) / (1 + q^2 R^2)$, where q is the momentum of one of the pions in the $\pi\pi$ rest system. At resonance, $q = q_r$.

VALUE (GeV^{-1})	DOCUMENT ID		TECN	CHG	COMMENT
$5.3^{+0.9}_{-0.7}$	CHABAUD	83	ASPK	0	17 $\pi^- p$ polarized

$\rho(770)$ WIDTH

We no longer list S-wave Breit-Wigner fits, or data with high combinatorial background.

MIXED CHARGES

VALUE (MeV)	DOCUMENT ID
151.2±1.2 OUR AVERAGE	Includes data from the 3 datablocks that follow this one.

CHARGED ONLY

The data in this block is included in the average printed for a previous datablock.

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
149.1± 2.9 OUR FIT						
149.1± 2.9 OUR AVERAGE						
155 ±11	2935	[13] CAPRARO	87	SPEC	−	200 π^- Cu $\to \pi^- \pi^0$ Cu
154 ±20	967	[13] CAPRARO	87	SPEC	−	200 π^- Pb $\to \pi^- \pi^0$ Pb
150 ± 5		HUSTON	86	SPEC	+	202 π^+ A $\to \pi^+ \pi^0$ A
146 ±12	6500	[14] BYERLY	73	OSPK	−	5 $\pi^- p$
148.2± 4.1	9650	[15] PISUT	68	RVUE	−	1.7–3.2 $\pi^- p$, t <10
146 ±13	900	EISNER	67	HBC	−	4.2 $\pi^- p$, t <10

NEUTRAL ONLY, PHOTOPRODUCED

The data in this block is included in the average printed for a previous datablock.

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
150.9± 3.0		BARTALUCCI	78	CNTR	0	$\gamma p \to e^+ e^- p$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
147 ±11		GLADDING	73	CNTR	0	2.9–4.7 γp
155.0±12.0	2430	BALLAM	72	HBC	0	4.7 γp
145.0±13.0	1930	BALLAM	72	HBC	0	2.8 γp
140.0± 5.0		ALVENSLEBEN	70	CNTR	0	γA, t <0.01
146.1± 2.9	140k	BIGGS	70	CNTR	0	<4.1 γC $\to \pi^+ \pi^-$ C
160.0±10.0		LANZEROTTI	68	CNTR	0	γp
130 ± 5	4000	ASBURY	67B	CNTR	0	$\gamma +$ Pb

NEUTRAL ONLY, OTHER REACTIONS

The data in this block is included in the average printed for a previous datablock.

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
151.9± 1.5 OUR FIT						
151.9± 1.5 OUR AVERAGE						
145.7± 5.3		WEIDENAUER	93	ASTE		$\overline{p}p \to \pi^+ \pi^- \omega$
150.5± 3.0		[16] BARKOV	85	OLYA	0	$e^+ e^- \to \pi^+ \pi^-$
148.0± 6.0		[17,18] BOHACIK	80	RVUE	0	
152.0± 9.0		[14] WICKLUND	78	ASPK	0	3,4,6 $\pi^\pm p N$
154.0± 2.0	76000	DEUTSCH...	76	HBC	0	16 $\pi^+ p$
157.0± 8.0	6800	RATCLIFF	72	ASPK	0	15 $\pi^- p$, t <0.3
143.0± 8.0	1700	REYNOLDS	69	HBC	0	2.26 $\pi^- p$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
138 ± 1		[19] GESHKENBEIN	89	RVUE		π form factor
$160.0^{+4.1}_{-4.0}$		[20] CHABAUD	83	ASPK	0	17 $\pi^- p$ polarized
155 ± 1		[21] HEYN	81	RVUE	0	π form factor
148.0± 1.3		[17,18] LANG	79	RVUE	0	
146 ±14	4100	ENGLER	74	DBC	0	6 $\pi^+ n \to \pi^+ \pi^- p$
143 ±13		[18] ESTABROOKS	74	RVUE	0	17 $\pi^- p \to \pi^+ \pi^- n$
160.0±10.0	32000	[17] PROTOPOP...	73	HBC	0	7.1 $\pi^+ p$, t <0.4
145.0±12.0	2250	[13] HYAMS	68	OSPK	0	11.2 $\pi^- p$
163.0±15.0	13300	[22] PISUT	68	RVUE	0	1.7–3.2 $\pi^- p$, t <10

[13] Width errors enlarged by us to $4\Gamma/\sqrt{N}$; see the note with the $K^*(892)$ mass.
[14] Phase shift analysis. Systematic errors added corresponding to spread of different fits.
[15] From fit of 3-parameter relativistic P-wave Breit-Wigner to total mass distribution. Includes BATON 68, MILLER 67B, ALFF-STEINBERGER 66, HAGOPIAN 66, HAGOPIAN 66B, JACOBS 66B, JAMES 66, WEST 66, BLIEDEN 65 and CARMONY 64.
[16] From the Gounaris-Sakurai parametrization of the pion form factor.
[17] From pole extrapolation.
[18] From phase shift analysis of GRAYER 74 data.
[19] Includes BARKOV 85 data. Model-dependent width definition.
[20] From fit of 3-parameter relativistic Breit-Wigner to helicity-zero part of P-wave intensity. CHABAUD 83 includes data of GRAYER 74.
[21] HEYN 81 includes all spacelike and timelike F_π values until 1978.
[22] Includes MALAMUD 69, ARMENISE 68, BACON 67, HUWE 67, MILLER 67B, ALFF-STEINBERGER 66, HAGOPIAN 66, HAGOPIAN 66B, JACOBS 66B, JAMES 66, WEST 66, GOLDHABER 64, ABOLINS 63.

$\rho(770)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)	Scale factor/ Confidence level
Γ_1	$\pi\pi$	~ 100 %	
	$\rho(770)^\pm$ decays		
Γ_2	$\pi^\pm \pi^0$	~ 100 %	
Γ_3	$\pi^\pm \gamma$	(4.5 ±0.5) × 10^{-4}	S=2.2
Γ_4	$\pi^\pm \eta$	< 6 × 10^{-3}	CL=84%
Γ_5	$\pi^\pm \pi^+ \pi^- \pi^0$	< 2.0 × 10^{-3}	CL=84%
	$\rho(770)^0$ decays		
Γ_6	$\pi^+ \pi^-$	~ 100 %	
Γ_7	$\pi^+ \pi^- \gamma$	(9.9 ±1.6) × 10^{-3}	
Γ_8	$\pi^0 \gamma$	(7.9 ±2.0) × 10^{-4}	
Γ_9	$\eta\gamma$	(3.8 ±0.7) × 10^{-4}	
Γ_{10}	$\mu^+ \mu^-$	[a] (4.60±0.28) × 10^{-5}	
Γ_{11}	$e^+ e^-$	[a] (4.46±0.21) × 10^{-5}	
Γ_{12}	$\pi^+ \pi^- \pi^0$	< 1.2 × 10^{-4}	CL=90%
Γ_{13}	$\pi^+ \pi^- \pi^+ \pi^-$	< 2 × 10^{-4}	CL=90%
Γ_{14}	$\pi^+ \pi^- \pi^0 \pi^0$	< 4 × 10^{-5}	CL=90%

[a] The $e^+ e^-$ branching fraction is from $e^+ e^- \to \pi^+ \pi^-$ experiments only. The $\omega\rho$ interference is then due to $\omega\rho$ mixing only, and is expected to be small. If $e\mu$ universality holds, $\Gamma(\rho^0 \to \mu^+ \mu^-) = \Gamma(\rho^0 \to e^+ e^-) \times 0.99785$.