$\rho(770)$

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

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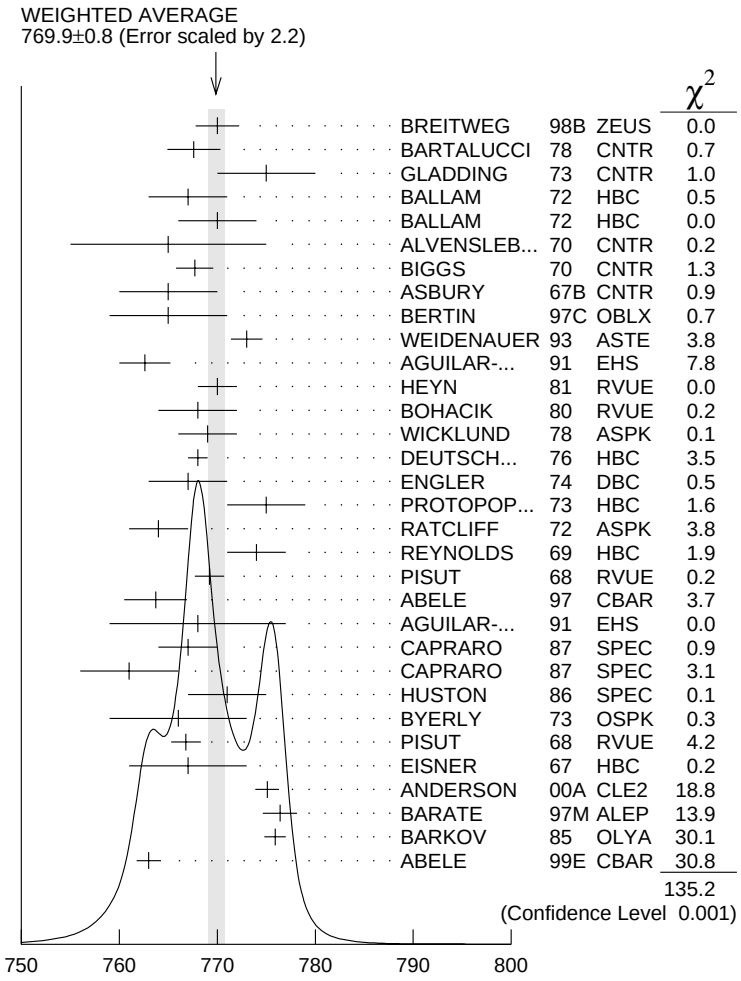
$\rho(770)$ MASS

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

MIXED CHARGES

VALUE (MeV)	*DOCUMENT ID*	
769.9±0.8 OUR AVERAGE	Includes data from the 5 datablocks that follow this one. Error includes scale factor of 2.2. See the ideogram below.	



$\rho(770)$ MASS MIXED CHARGES

MIXED CHARGES, τ DECAYS and e^+e^-

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*

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

775.7±0.7 OUR AVERAGE

775.1±1.1±0.5	87,000	[1,2] ANDERSON	00A	CLE2		$\tau^- \to \pi^-\pi^0\nu_\tau$
776.4±0.9±1.5		[2] BARATE	97M	ALEP		$\tau^- \to \pi^-\pi^0\nu_\tau$
775.9±1.1		[3] BARKOV	85	OLYA	0	$e^+e^- \to \pi^+\pi^-$

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

775.1±0.7±5.3	[4] BENAYOUN	98	RVUE		$e^+e^- \to \pi^+\pi^-$, $\mu^+\mu^-$
770.5±1.9±5.1	[5] GARDNER	98	RVUE		0.28–0.92 $e^+e^- \to \pi^+\pi^-$
764.1±0.7	[6] O'CONNELL	97	RVUE		$e^+e^- \to \pi^+\pi^-$
757.5±1.5	[7] BERNICHA	94	RVUE		$e^+e^- \to \pi^+\pi^-$
768 ±1	[8] GESHKEN...	89	RVUE		$e^+e^- \to \pi^+\pi^-$

MIXED CHARGES, OTHER REACTIONS

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*

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

763.0±0.3±1.2	600k	[9] ABELE	99E	CBAR	0±	0.0 $\overline{p}p \to \pi^+\pi^-\pi^0$

CHARGED ONLY, HADROPRODUCED

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*

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

766.5±1.1 OUR AVERAGE

763.7±3.2		ABELE	97	CBAR		$\overline{p}n \to \pi^-\pi^0\pi^0$
768 ±9		AGUILAR-...	91	EHS		400 pp
767 ±3	2935	[10] CAPRARO	87	SPEC	−	200 π^- Cu → $\pi^-\pi^0$ Cu
761 ±5	967	[10] CAPRARO	87	SPEC	−	200 π^- Pb → $\pi^-\pi^0$ Pb
771 ±4		HUSTON	86	SPEC	+	202 π^+ A → $\pi^+\pi^0$ A
766 ±7	6500	[11] BYERLY	73	OSPK	−	5 π^-p
766.8±1.5	9650	[12] PISUT	68	RVUE	−	1.7–3.2 π^-p, t <10
767 ±6	900	[10] EISNER	67	HBC	−	4.2 π^-p, t <10

NEUTRAL ONLY, PHOTOPRODUCED

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*

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

768.5± 1.1 OUR AVERAGE

770 ± 2 ±1	79k	[13] BREITWEG	98B	ZEUS	0	50–100 γp
767.6± 2.7		BARTALUCCI	78	CNTR	0	$\gamma p \to e^+e^- p$
775 ± 5		GLADDING	73	CNTR	0	2.9–4.7 γp
767 ± 4	1930	BALLAM	72	HBC	0	2.8 γp
770 ± 4	2430	BALLAM	72	HBC	0	4.7 γp
765 ±10		ALVENSLEB...	70	CNTR	0	γA, t <0.01
767.7± 1.9	140k	BIGGS	70	CNTR	0	<4.1 γC → $\pi^+\pi^-$C
765 ± 5	4000	ASBURY	67B	CNTR	0	γ + Pb

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

771 ± 2	79k	[14] BREITWEG	98B	ZEUS	0	50–100 γp

NEUTRAL ONLY, OTHER REACTIONS

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*

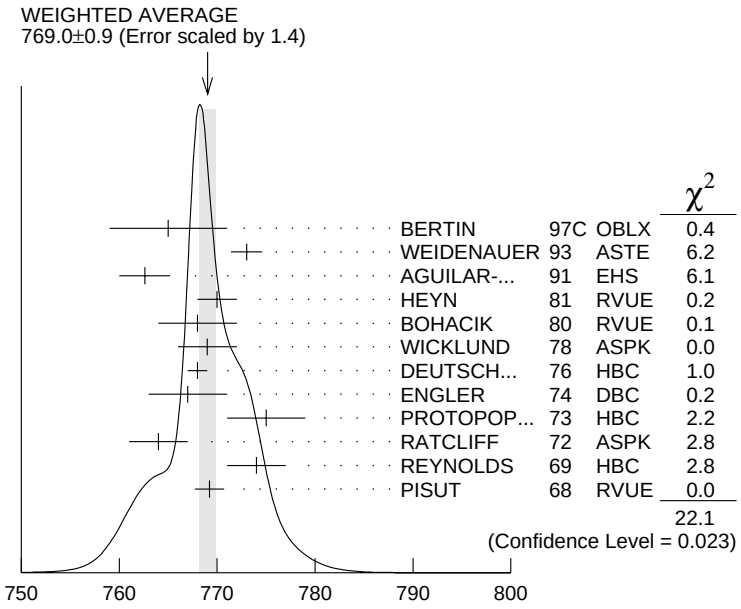
The data in this block is included in the average printed for a previous datablock.

769.0±0.9 OUR AVERAGE Error includes scale factor of 1.4. See the ideogram below.

765 ±6		BERTIN	97C	OBLX		0.0 $\overline{p}p \rightarrow \pi^+\pi^-\pi^0$
773 ±1.6		WEIDENAUER	93	ASTE		$\overline{p}p \rightarrow \pi^+\pi^-\omega$
762.6±2.6		AGUILAR-...	91	EHS		400 pp
770 ±2		[15] HEYN	81	RVUE		Pion form factor
768 ±4		[16,17] BOHACIK	80	RVUE	0	
769 ±3		[11] WICKLUND	78	ASPK	0	3,4,6 $\pi^\pm N$
768 ±1	76000	DEUTSCH...	76	HBC	0	16 $\pi^+ p$
767 ±4	4100	ENGLER	74	DBC	0	6 $\pi^+ n \rightarrow \pi^+\pi^- p$
775 ±4	32000	[16] PROTOPOP...	73	HBC	0	7.1 $\pi^+ p$, t <0.4
764 ±3	6800	RATCLIFF	72	ASPK	0	15 $\pi^- p$, t <0.3
774 ±3	1700	REYNOLDS	69	HBC	0	2.26 $\pi^- p$
769.2±1.5	13300	[18] PISUT	68	RVUE	0	1.7–3.2 $\pi^- p$, t <10

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

762.3±0.5±1.2	600k	[19] ABELE	99E	CBAR	0	0.0 $\overline{p}p \rightarrow \pi^+\pi^-\pi^0$
777 ±2	4943	[20] ADAMS	97	E665		470 $\mu p \rightarrow \mu X B$
770 ±2		[21] BOGOLYUB...	97	MIRA		32 $\overline{p}p \rightarrow \pi^+\pi^-$ X
768 ±8		[21] BOGOLYUB...	97	MIRA		32 $pp \rightarrow \pi^+\pi^-$ X
761.1±2.9		DUBNICKA	89	RVUE		π form factor
777.4±2.0		[22] CHABAUD	83	ASPK	0	17 $\pi^- p$ polarized
769.5±0.7		[16,17] LANG	79	RVUE	0	
770 ±9		[17] ESTABROOKS	74	RVUE	0	17 $\pi^- p \rightarrow \pi^+\pi^- n$
773.5±1.7	11200	[10] JACOBS	72	HBC	0	2.8 $\pi^- p$
775 ±3	2250	HYAMS	68	OSPK	0	11.2 $\pi^- p$



$\rho(770)^0$ mass (MeV)

[1] $\rho(1700)$ mass and width fixed at 1700 MeV and 235 MeV respectively.
[2] From the GOUNARIS 68 parametrization of the pion form factor. The second error is a model error taking into account different parametrizations of the pion form factor.
[3] From the GOUNARIS 68 parametrization of the pion form factor.
[4] Using the data of BARKOV 85 in the hidden local symmetry model.
[5] From the fit to $e^+e^- \rightarrow \pi^+\pi^-$ data from the compilations of HEYN 81 and BARKOV 85, including the GOUNARIS 68 parametrization of the pion form factor.
[6] A fit of BARKOV 85 data assuming the direct $\omega\pi\pi$ coupling.
[7] Applying the S-matrix formalism to the BARKOV 85 data.
[8] Includes BARKOV 85 data. Model-dependent width definition.
[9] Assuming the equality of ρ^+ and ρ^- masses and widths.
[10] Mass errors enlarged by us to $\Gamma/\sqrt{N}$; see the note with the $K^*(892)$ mass.
[11] Phase shift analysis. Systematic errors added corresponding to spread of different fits.
[12] 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.
[13] From the parametrization according to SOEDING 66.
[14] From the parametrization according to ROSS 66.
[15] HEYN 81 includes all spacelike and timelike F_π values until 1978.
[16] From pole extrapolation.
[17] From phase shift analysis of GRAYER 74 data.
[18] 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.
[19] Using relativistic Breit-Wigner and taking into account ρ-ω interference.
[20] Systematic errors not evaluated.
[21] Systematic effects not studied.
[22] From fit of 3-parameter relativistic Breit-Wigner to helicity-zero part of P-wave intensity. CHABAUD 83 includes data of GRAYER 74.

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

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
0.4±0.8 OUR AVERAGE						
1.6±0.6±1.7	600k	ABELE	99E	CBAR	0±	0.0 $\overline{p}p \rightarrow \pi^+\pi^-\pi^0$
0.0±1.0		[23] BARATE	97M	ALEP		$\tau^- \rightarrow \pi^-\pi^0\nu_\tau$
−4 ±4	3000	[24] REYNOLDS	69	HBC	−0	2.26 $\pi^- p$
−5 ±5	3600	[24] FOSTER	68	HBC	±0	0.0 $\overline{p}p$
2.4±2.1	22950	[25] PISUT	68	RVUE		$\pi N \rightarrow \rho N$

[23] Using the compilation of e^+e^- data from BARKOV 85.
[24] From quoted masses of charged and neutral modes.
[25] 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*
$\mathbf{5.3^{+0.9}_{-0.7}}$	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*
150.2±0.8 OUR AVERAGE	Includes data from the 5 datablocks that follow this one.

MIXED CHARGES, τ DECAYS and e^+e^-

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
The data in this block is included in the average printed for a previous datablock.						
150.4±1.6 OUR AVERAGE						
150.4±1.4±1.4	87,000[26,27]	ANDERSON	00A	CLE2		$\tau^- \rightarrow \pi^-\pi^0\nu_\tau$
150.5±1.6±6.3		[27] BARATE	97M	ALEP		$\tau^- \rightarrow \pi^-\pi^0\nu_\tau$
150.5±3.0		[28] BARKOV	85	OLYA	0	$e^+e^- \rightarrow \pi^+\pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
147.9±1.5±7.5		[29] BENAYOUN	98	RVUE		$e^+e^- \rightarrow \pi^+\pi^-, \mu^+\mu^-$
153.5±1.3±4.6		[30] GARDNER	98	RVUE		0.28–0.92 $e^+e^- \rightarrow \pi^+\pi^-$
145.0±1.7		[31] O'CONNELL	97	RVUE		$e^+e^- \rightarrow \pi^+\pi^-$
142.5±3.5		[32] BERNICHA	94	RVUE		$e^+e^- \rightarrow \pi^+\pi^-$
138 ±1		[33] GESHKEN...	89	RVUE		$e^+e^- \rightarrow \pi^+\pi^-$

MIXED CHARGES, OTHER REACTIONS

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
The data in this block is included in the average printed for a previous datablock.						
149.5±1.3	600k	[34] ABELE	99E	CBAR	0±	0.0 $\overline{p}p \rightarrow \pi^+\pi^-\pi^0$

CHARGED ONLY, HADROPRODUCED

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
The data in this block is included in the average printed for a previous datablock.						
150.2± 2.4 OUR FIT						
150.2± 2.4 OUR AVERAGE						
152.8± 4.3		ABELE	97	CBAR		$\overline{p}n \rightarrow \pi^-\pi^0\pi^0$
155 ±11	2935	[35] CAPRARO	87	SPEC	−	200 π^- Cu → $\pi^-\pi^0$ Cu
154 ±20	967	[35] CAPRARO	87	SPEC	−	200 π^- Pb → $\pi^-\pi^0$ Pb
150 ± 5		HUSTON	86	SPEC	+	202 π^+ A → $\pi^+\pi^0$ A
146 ±12	6500	[36] BYERLY	73	OSPK	−	5 $\pi^- p$
148.2± 4.1	9650	[37] 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

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
The data in this block is included in the average printed for a previous datablock.						
150.7± 2.9 OUR AVERAGE						
146 ± 3 ±13	79k	[38] BREITWEG	98B	ZEUS	0	50–100 γp
150.9± 3.0		BARTALUCCI	78	CNTR	0	$\gamma p \rightarrow e^+e^- p$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
138 ± 3	79k	[39] BREITWEG	98B	ZEUS	0	50–100 γp
147 ±11		GLADDING	73	CNTR	0	2.9–4.7 γp
155 ±12	2430	BALLAM	72	HBC	0	4.7 γp
145 ±13	1930	BALLAM	72	HBC	0	2.8 γp
140 ± 5		ALVENSLEB...	70	CNTR	0	γA, t <0.01
146.1± 2.9	140k	BIGGS	70	CNTR	0	<4.1 γC → $\pi^+\pi^-$ C
160 ±10		LANZEROTTI	68	CNTR	0	γp
130 ± 5	4000	ASBURY	67B	CNTR	0	γ + Pb

NEUTRAL ONLY, OTHER REACTIONS

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
The data in this block is included in the average printed for a previous datablock.						
150.9± 2.0 OUR FIT Error includes scale factor of 1.3.						
150.9± 1.7 OUR AVERAGE Error includes scale factor of 1.1.						
122 ±20		BERTIN	97C	OBLX		0.0 $\overline{p}p \rightarrow \pi^+\pi^-\pi^0$
145.7± 5.3		WEIDENAUER	93	ASTE		$\overline{p}p \rightarrow \pi^+\pi^-\omega$
144.9± 3.7		DUBNICKA	89	RVUE		π form factor
148 ± 6		[40,41] BOHACIK	80	RVUE	0	
152 ± 9		[36] WICKLUND	78	ASPK	0	3,4,6 $\pi^\pm p N$
154 ± 2	76000	DEUTSCH...	76	HBC	0	16 $\pi^+ p$
157 ± 8	6800	RATCLIFF	72	ASPK	0	15 $\pi^- p$, t <0.3
143 ± 8	1700	REYNOLDS	69	HBC	0	2.26 $\pi^- p$

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

147.0± 2.5	600k	[42]	ABELE	99E	CBAR	0	0.0 $\overline{p}p \rightarrow \pi^+\pi^-\pi^0$
146 ± 3	4943	[43]	ADAMS	97	E665		470 $\mu p \rightarrow \mu X B$
$160.0^{+\ 4.1}_{-\ 4.0}$		[44]	CHABAUD	83	ASPK	0	17 $\pi^- p$ polarized
155 ± 1		[45]	HEYN	81	RVUE	0	π form factor
148.0± 1.3		[40,41]	LANG	79	RVUE	0	
146 ±14	4100		ENGLER	74	DBC	0	6 $\pi^+ n \rightarrow \pi^+\pi^- p$
143 ±13		[41]	ESTABROOKS	74	RVUE	0	17 $\pi^- p \rightarrow \pi^+\pi^- n$
160 ±10	32000	[40]	PROTOPOP...	73	HBC	0	7.1 $\pi^+ p$, t <0.4
145 ±12	2250	[35]	HYAMS	68	OSPK	0	11.2 $\pi^- p$
163 ±15	13300	[46]	PISUT	68	RVUE	0	1.7–3.2 $\pi^- p$, t <10

[26] $\rho(1700)$ mass and width fixed at 1700 MeV and 235 MeV respectively.
[27] From the GOUNARIS 68 parametrization of the pion form factor. The second error is a model error taking into account different parametrizations of the pion form factor.
[28] From the GOUNARIS 68 parametrization of the pion form factor.
[29] Using the data of BARKOV 85 in the hidden local symmetry model.
[30] From the fit to $e^+e^- \rightarrow \pi^+\pi^-$ data from the compilations of HEYN 81 and BARKOV 85, including the GOUNARIS 68 parametrization of the pion form factor.
[31] A fit of BARKOV 85 data assuming the direct $\omega\pi\pi$ coupling.
[32] Applying the S-matrix formalism to the BARKOV 85 data.
[33] Includes BARKOV 85 data. Model-dependent width definition.
[34] Assuming the equality of ρ^+ and ρ^- masses and widths.
[35] Width errors enlarged by us to $4\Gamma/\sqrt{N}$; see the note with the $K^*(892)$ mass.
[36] Phase shift analysis. Systematic errors added corresponding to spread of different fits.
[37] 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.
[38] From the parametrization according to SOEDING 66.
[39] From the parametrization according to ROSS 66.
[40] From pole extrapolation.
[41] From phase shift analysis of GRAYER 74 data.
[42] Using relativistic Breit-Wigner and taking into account ρ-ω interference.
[43] Systematic errors not evaluated.
[44] From fit of 3-parameter relativistic Breit-Wigner to helicity-zero part of P-wave intensity. CHABAUD 83 includes data of GRAYER 74.
[45] HEYN 81 includes all spacelike and timelike F_π values until 1978.
[46] 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.

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

VALUE	DOCUMENT ID		TECN	COMMENT
−0.1±1.9	[47] BARATE		97M ALEP	$\tau^- \rightarrow \pi^-\pi^0\nu_\tau$

[47] Using the compilation of e^+e^- data from BARKOV 85.

$\rho(770)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)	Scale factor/ Confidence level
Γ_1	$\pi\pi$	∼ 100	%

$\rho(770)^{\pm}$ decays

Γ_2	$\pi^{\pm}\pi^0$		$\sim$ 100	%	
Γ_3	$\pi^{\pm}\gamma$		(4.5 $\pm$0.5) $\times 10^{-4}$		S=2.2
Γ_4	$\pi^{\pm}\eta$		$<$ 6	$\times 10^{-3}$	CL=84%
Γ_5	$\pi^{\pm}\pi^+\pi^-\pi^0$		$<$ 2.0	$\times 10^{-3}$	CL=84%

$\rho(770)^0$ decays

Γ_6	$\pi^+\pi^-$		$\sim$ 100	%	
Γ_7	$\pi^+\pi^-\gamma$		(9.9 $\pm$1.6) $\times 10^{-3}$		
Γ_8	$\pi^0\gamma$		(7.9 $\pm$2.0) $\times 10^{-4}$		
Γ_9	$\eta\gamma$		(3.8 $\pm$0.7) $\times 10^{-4}$		
Γ_{10}	$\pi^0\pi^0\gamma$		(4.8 $^{+3.4}_{-1.9}$) $\times 10^{-5}$		
Γ_{11}	$\mu^+\mu^-$	[a]	(4.60$\pm$0.28) $\times 10^{-5}$		
Γ_{12}	e^+e^-	[a]	(4.49$\pm$0.22) $\times 10^{-5}$		
Γ_{13}	$\pi^+\pi^-\pi^0$		$<$ 1.2	$\times 10^{-4}$	CL=90%
Γ_{14}	$\pi^+\pi^-\pi^+\pi^-$		(1.8 $\pm$0.9) $\times 10^{-5}$		
Γ_{15}	$\pi^+\pi^-\pi^0\pi^0$		$<$ 4	$\times 10^{-5}$	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, $\Gamma(\rho^0 \to \mu^+\mu^-) = \Gamma(\rho^0 \to e^+e^-) \times 0.99785$.

CONSTRAINED FIT INFORMATION

An overall fit to the total width and a partial width uses 10 measurements and one constraint to determine 3 parameters. The overall fit has a $\chi^2 = 10.7$ for 8 degrees of freedom.

The following *off-diagonal* array elements are the correlation coefficients $\langle \delta p_i \delta p_j \rangle / (\delta p_i \cdot \delta p_j)$, in percent, from the fit to parameters p_i, including the branching fractions, $x_i \equiv \Gamma_i/\Gamma_{\text{total}}$. The fit constrains the x_i whose labels appear in this array to sum to one.

x_3	-100	
Γ	15	-15
	x_2	x_3

	Mode	Rate (MeV)	Scale factor
Γ_2	$\pi^{\pm}\pi^0$	150.2 $\pm$2.4	
Γ_3	$\pi^{\pm}\gamma$	0.068$\pm$0.007	2.3

CONSTRAINED FIT INFORMATION

An overall fit to the total width, a partial width, and a branching ratio uses 10 measurements and one constraint to determine 4 parameters. The overall fit has a $\chi^2 = 9.9$ for 7 degrees of freedom.

The following *off-diagonal* array elements are the correlation coefficients $\left\langle \delta p_i \delta p_j \right\rangle / (\delta p_i \cdot \delta p_j)$, in percent, from the fit to parameters p_i, including the branching fractions, $x_i \equiv \Gamma_i/\Gamma_{\text{total}}$. The fit constrains the x_i whose labels appear in this array to sum to one.

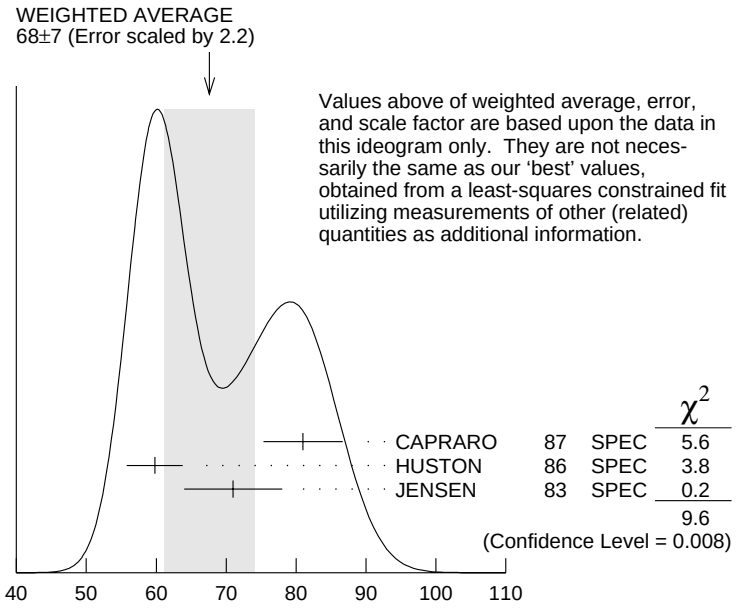
x_{11}	−79		
x_{12}	−61	0	
Γ	16	0	−27
	x_6	x_{11}	x_{12}

	Mode	Rate (MeV)		Scale factor
Γ_6	$\pi^+\pi^-$	150.8	±2.0	1.3
Γ_{11}	$\mu^+\mu^-$	[a] 0.0069	±0.0004	
Γ_{12}	e^+e^-	[a] 0.00677	±0.00032	

$\rho(770)$ PARTIAL WIDTHS

$\Gamma(\pi^\pm\gamma)$ Γ_3

VALUE (keV)	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
68 ±7 OUR FIT Error includes scale factor of 2.3.					
68 ±7 OUR AVERAGE Error includes scale factor of 2.2. See the ideogram below.					
81 ±4 ±4	CAPRARO	87	SPEC	−	200 π^- A → $\pi^-\pi^0$ A
59.8±4.0	HUSTON	86	SPEC	+	202 π^+ A → $\pi^+\pi^0$ A
71 ±7	JENSEN	83	SPEC	−	156–260 π^- A → $\pi^-\pi^0$ A



$\Gamma\left(\pi^{\pm}\gamma\right)$ (keV)

$\Gamma(e^+e^-)$ Γ_{12}

VALUE (keV)	*DOCUMENT ID*		*TECN*	*COMMENT*
6.77±0.32 OUR FIT				
6.77±0.10±0.30	BARKOV	85	OLYA	$e^+e^- \to \pi^+\pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
6.3 ±0.1	[48] BENAYOUN	98	RVUE	$e^+e^- \to \pi^+\pi^-$, $\mu^+\mu^-$

[48] Using the data of BARKOV 85 in the hidden local symmetry model.

$\Gamma(\pi^0\gamma)$ Γ_8

VALUE (keV)	*DOCUMENT ID*		*TECN*	*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •				
121±31	DOLINSKY	89	ND	$e^+e^- \to \pi^0\gamma$

$\Gamma(\eta\gamma)$ Γ_9

VALUE (keV)	*DOCUMENT ID*		*TECN*	*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •				
62±17	[49] DOLINSKY	89	ND	$e^+e^- \to \eta\gamma$

[49] Solution corresponding to constructive ω-ρ interference.

$\Gamma(\pi^+\pi^-\pi^+\pi^-)$ Γ_{14}

VALUE (keV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •					
2.8±1.4±0.5	153	AKHMETSHIN	00	CMD2	0.6–0.97 $e^+e^- \to \pi^+\pi^-\pi^+\pi^-$

$\rho(770)\ \Gamma(i)\Gamma(e^+e^-)/\Gamma^2(\text{total})$

$\Gamma(e^+e^-) \times \Gamma(\eta\gamma)/\Gamma^2_{\text{total}}$ $\Gamma_{12}\Gamma_9/\Gamma^2$

VALUE (units 10^{-8})	EVTS	DOCUMENT ID		TECN	COMMENT
1.21±0.14±0.04	312	[50] ACHASOV	00D	SND	$e^+e^- \to \eta\gamma$

[50] From the $\eta \to 3\pi^0$ decay and using B($\eta \to 3\pi^0$)= (32.2 ± 0.4) × 10^{-2}.

$\rho(770)$ BRANCHING RATIOS

$\Gamma(\pi^\pm\eta)/\Gamma(\pi\pi)$ Γ_4/Γ_1

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	CHG	COMMENT
<60	84	FERBEL	66	HBC	±	$\pi^\pm p$ above 2.5

$\Gamma(\pi^\pm\pi^+\pi^-\pi^0)/\Gamma(\pi\pi)$ Γ_5/Γ_1

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	CHG	COMMENT
<20	84	FERBEL	66	HBC	±	$\pi^\pm p$ above 2.5
• • • We do not use the following data for averages, fits, limits, etc. • • •						
35±40		JAMES	66	HBC	+	2.1 $\pi^+ p$

$\Gamma(\mu^+\mu^-)/\Gamma(\pi^+\pi^-)$ Γ_{11}/Γ_6

VALUE (units 10^{-5})	DOCUMENT ID		TECN	COMMENT
4.60±0.28 OUR FIT				
4.6 ±0.2 ±0.2	ANTIPOV	89	SIGM	π^- Cu $\to \mu^+\mu^-\pi^-$ Cu
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$8.2\ ^{+1.6}_{-3.6}$	[51] ROTHWELL	69	CNTR	Photoproduction
5.6 ±1.5	[52] WEHMANN	69	OSPK	12 π^- C, Fe
$9.7\ ^{+3.1}_{-3.3}$	[53] HYAMS	67	OSPK	11 π^- Li, H

[51] Possibly large ρ-ω interference leads us to increase the minus error.
[52] Result contains 11 ± 11% correction using SU(3) for central value. The error on the correction takes account of possible ρ-ω interference and the upper limit agrees with the upper limit of $\omega \to \mu^+\mu^-$ from this experiment.
[53] HYAMS 67's mass resolution is 20 MeV. The ω region was excluded.

$\Gamma(e^+e^-)/\Gamma(\pi\pi)$ Γ_{12}/Γ_1

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
0.41±0.05	BENAKSAS	72	OSPK	e^+e^-

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

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
3.8 ±0.7 OUR AVERAGE						
4.0 ±1.1		[54] DOLINSKY	89	ND		$e^+e^- \to \eta\gamma$
3.6 ±0.9		[54] ANDREWS	77	CNTR	0	6.7–10 γ Cu
• • • We do not use the following data for averages, fits, limits, etc. • • •						
2.69±0.32±0.16	312	[55] ACHASOV	00D	SND		$e^+e^- \to \eta\gamma$
$1.9\ ^{+0.6}_{-0.8}$		[56] BENAYOUN	96	RVUE		0.54-1.04 $e^+e^- \to \eta\gamma$

[54] Solution corresponding to constructive ω-ρ interference.
[55] Using $B(\rho \to e^+e^-) = (4.49 \pm 0.22) \times 10^{-5}$ and $B(\eta \to 3\pi^0) = (32.2 \pm 0.4) \times 10^{-2}$.
[56] Reanalysis of DRUZHININ 84, DOLINSKY 89, and DOLINSKY 91 taking into account a triangle anomaly contribution. Constructive ρ-ω interference solution.

$\Gamma(\pi^+\pi^-\pi^+\pi^-)/\Gamma_{total}$ Γ_{14}/Γ

VALUE (units 10^{-5})	*CL%*	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
1.8±0.9±0.3		153	AKHMETSHIN	00	CMD2	0.6–0.97 $e^+e^- \to \pi^+\pi^-\pi^+\pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<20	90		KURDADZE	88	OLYA	$e^+e^- \to \pi^+\pi^-\pi^+\pi^-$

$\Gamma(\pi^+\pi^-\pi^+\pi^-)/\Gamma(\pi\pi)$ Γ_{14}/Γ_1

VALUE (units 10^{-4})	*CL%*	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<15	90	ERBE	69	HBC	0	2.5–5.8 γp
<20		CHUNG	68	HBC	0	3.2,4.2 $\pi^- p$
<20	90	HUSON	68	HLBC	0	16.0 $\pi^- p$
<80		JAMES	66	HBC	0	2.1 $\pi^+ p$

$\Gamma(\pi^+\pi^-\pi^0)/\Gamma_{total}$ Γ_{13}/Γ

VALUE (units 10^{-4})	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
<1.2	90	VASSERMAN	88B	ND	$e^+e^- \to \pi^+\pi^-\pi^0$

$\Gamma(\pi^+\pi^-\pi^0)/\Gamma(\pi\pi)$ Γ_{13}/Γ_1

VALUE	*CL%*	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •						
~ 0.01		BRAMON	86	RVUE	0	$J/\psi \to \omega\pi^0$
<0.01	84	[57] ABRAMS	71	HBC	0	3.7 $\pi^+ p$

[57] Model dependent, assumes I = 1, 2, or 3 for the 3π system.

$\Gamma(\pi^+\pi^-\pi^0\pi^0)/\Gamma_{total}$ Γ_{15}/Γ

VALUE (units 10^{-4})	*CL%*	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
<0.4	90	AULCHENKO	87C	ND	0	$e^+e^- \to \pi^+\pi^-\pi^0\pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<2	90	KURDADZE	86	OLYA	0	$e^+e^- \to \pi^+\pi^-\pi^0\pi^0$

$\Gamma(\pi^+\pi^-\gamma)/\Gamma_{total}$ Γ_7/Γ

VALUE	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
0.0099±0.0016		[58] DOLINSKY	91	ND	$e^+e^- \to \pi^+\pi^-\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.0111±0.0014		[59] VASSERMAN	88	ND	$e^+e^- \to \pi^+\pi^-\gamma$
<0.005	90	[60] VASSERMAN	88	ND	$e^+e^- \to \pi^+\pi^-\gamma$

[58] Bremsstrahlung from a decay pion and for photon energy above 50 MeV.
[59] Superseded by DOLINSKY 91.
[60] Structure radiation due to quark rearrangement in the decay.

$\Gamma(\pi^0\gamma)/\Gamma_{total}$ Γ_8/Γ

VALUE (units 10^{-4})	*DOCUMENT ID*		*TECN*	*COMMENT*
7.9±2.0	DOLINSKY	89	ND	$e^+e^- \to \pi^0\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
6.8±1.7	[61] BENAYOUN	96	RVUE	0.54-1.04 $e^+e^- \to \pi^0\gamma$

[61] Reanalysis of DRUZHININ 84, DOLINSKY 89, and DOLINSKY 91 taking into account a triangle anomaly contribution.

$\Gamma(\pi^0\pi^0\gamma)/\Gamma_{total}$ Γ_{10}/Γ

VALUE (units 10^{-5})	*EVTS*	*DOCUMENT ID*	*TECN*	*COMMENT*
$\mathbf{4.8^{+3.4}_{-1.8}\pm0.5}$	63	ACHASOV	00G SND	$e^+e^- \to \pi^0\pi^0\gamma$

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