NODE=M001

$\omega(782)$

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

ω(782) MASS

NODE=M001M

NODE=M001M

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
782.66±0.13 OUR AVERAGE		Error includes scale factor of 2.0. See the ideogram below.			
$777.9 \pm 2.2\ ^{+4.3}_{-2.2}$	900k	ANDREEV	20	H1	$e p \to e \pi^+ \pi^- p$
$783.20 \pm 0.13 \pm 0.16$	18680	AKHMETSHIN	05	CMD2	0.60–1.38 $e^+ e^- \to \pi^0 \gamma$
$782.68 \pm 0.09 \pm 0.04$	11200	[1] AKHMETSHIN	04	CMD2	$e^+ e^- \to \pi^+ \pi^- \pi^0$
$782.79 \pm 0.08 \pm 0.09$	1.2M	[2] ACHASOV	03D	RVUE	0.44–2.00 $e^+ e^- \to \pi^+ \pi^- \pi^0$
$781.96 \pm 0.17 \pm 0.80$	11k	[3] AMSLER	94C	CBAR	0.0 $\overline{p} p \to \omega \eta \pi^0$
$782.08 \pm 0.36 \pm 0.82$	3463	[4] AMSLER	94C	CBAR	0.0 $\overline{p} p \to \omega \eta \pi^0$
$781.96 \pm 0.13 \pm 0.17$	15k	AMSLER	93B	CBAR	0.0 $\overline{p} p \to \omega \pi^0 \pi^0$
782.4 ± 0.2	270k	WEIDENAUER	93	ASTE	$\overline{p} p \to 2\pi^+ 2\pi^- \pi^0$
782.4 ± 0.5	7000	[5] KEYNE	76	CNTR	$\pi^- p \to \omega n$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
782.43 ± 0.03	34M	[6] IGNATOV	24	CMD3	$e^+ e^- \to \pi^+ \pi^-$
$782.58 \pm 0.03 \pm 0.01$		[7] HOID	20	RVUE	$e^+ e^- \to \pi^0 \gamma$
$781.68 \pm 0.09 \pm 0.03$		[8] COLANGELO	19	RVUE	$e^+ e^- \to \pi^+ \pi^-$
$782.63 \pm 0.03 \pm 0.01$		[9] HOFERICHT...	19	RVUE	$e^+ e^- \to \pi^+ \pi^- \pi^0$
781.91 ± 0.24		[10] LEES	12G	BABR	$e^+ e^- \to \pi^+ \pi^- \gamma$
$782.7 \pm 0.1 \pm 1.5$	19500	[11] WURZINGER	95	SPEC	1.33 $p d \to {}^3\text{He}\,\omega$
781.78 ± 0.10		[11] BARKOV	87	CMD	$e^+ e^- \to \pi^+ \pi^- \pi^0$
782.2 ± 0.4	1488	[12] KURDADZE	83B	OLYA	$e^+ e^- \to \pi^+ \pi^- \pi^0$
783.3 ± 0.4	433	CORDIER	80	DM1	$e^+ e^- \to \pi^+ \pi^- \pi^0$
782.5 ± 0.8	33260	ROOS	80	RVUE	0.0–3.6 $\overline{p} p$
782.6 ± 0.8	3000	BENKHEIRI	79	OMEG	9–12 $\pi^\pm p$
781.8 ± 0.6	1430	COOPER	78B	HBC	0.7–0.8 $\overline{p} p \to 5\pi$
782.7 ± 0.9	535	VANAPEL...	78	HBC	7.2 $\overline{p} p \to \overline{p} p \omega$
783.5 ± 0.8	2100	GESSAROLI	77	HBC	11 $\pi^- p \to \omega n$
782.5 ± 0.8	418	AGUILAR-...	72B	HBC	3.9,4.6 $K^- p$
783.4 ± 1.0	248	BIZZARRI	71	HBC	0.0 $p \overline{p} \to K^+ K^- \omega$
781.0 ± 0.6	510	BIZZARRI	71	HBC	0.0 $p \overline{p} \to K_1 K_1 \omega$
783.7 ± 1.0	3583	[13] COYNE	71	HBC	3.7 $\pi^+ p \to p \pi^+ \pi^+ \pi^- \pi^0$
784.1 ± 1.2	750	ABRAMOVI...	70	HBC	3.9 $\pi^- p$
783.2 ± 1.6		[14] BIGGS	70B	CNTR	$<$4.1 $\gamma \text{C} \to \pi^+ \pi^- \text{C}$
782.4 ± 0.5	2400	BIZZARRI	69	HBC	0.0 $\overline{p} p$

OCCUR=2

OCCUR=2

OCCUR=2

[1] Update of AKHMETSHIN 00C. NODE=M001M;LINKAGE=PT

[2] From the combined fit of ANTONELLI 92, ACHASOV 01E, ACHASOV 02E, and ACHASOV 03D data on the $\pi^+ \pi^- \pi^0$ and ANTONELLI 92 on the $\omega \pi^+ \pi^-$ final states. Supersedes ACHASOV 99E and ACHASOV 02E. NODE=M001M;LINKAGE=VH

[3] From the $\eta \to \gamma\gamma$ decay. NODE=M001M;LINKAGE=S1

[4] From the $\eta \to 3\pi^0$ decay. NODE=M001M;LINKAGE=S2

[5] Observed by threshold-crossing technique. Mass resolution = 4.8 MeV FWHM. NODE=M001M;LINKAGE=B

[6] From a fit of the pion form factor in the energy range 0.32 < $\sqrt{s}$ < 1.2 GeV using the GOUNARIS 68 parametrization with the complex phase of the $\rho - \omega$ interference leaving $\rho(1450)$, $\rho(1700)$ resonances as free parameters of the fit. Systematic errors not estimated. NODE=M001M;LINKAGE=J

[7] The values were extracted from a dispersively improved Breit-Wigner parameterization and do not include vacuum polarization. Inclusion of vacuum polarization gives 782.736 ± 0.024 MeV. NODE=M001M;LINKAGE=G

[8] The ω mass was extracted from a dispersively improved Breit-Wigner parameterization, the ω width fixed at 8.49 ± 0.08 MeV. The value does not include vacuum polarization which would shift the mass to $781.81 \pm 0.09 \pm 0.03$ MeV. The mixing parameter is assumed real valued. NODE=M001M;LINKAGE=A

[9] The values were extracted from a dispersively improved Breit-Wigner parameterization and do not include vacuum polarization. NODE=M001M;LINKAGE=H

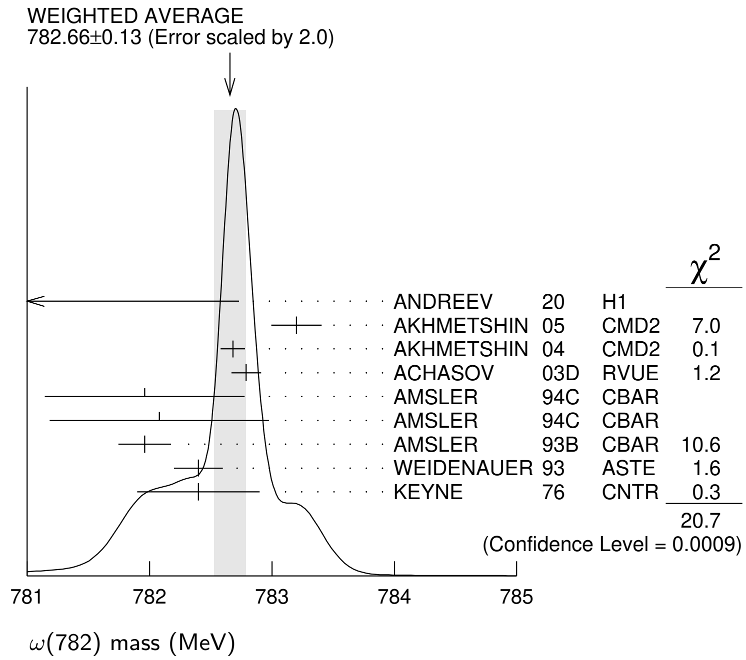
[10] From the $\rho - \omega$ interference in the $\pi^+ \pi^-$ mass spectrum using the Breit-Wigner for the ω and leaving its mass and width as free parameters of the fit. NODE=M001M;LINKAGE=LE

[11] Systematic uncertainties underestimated. NODE=M001M;LINKAGE=KB

[12] Systematic uncertainties not estimated. NODE=M001M;LINKAGE=I

[13] From best-resolution sample of COYNE 71. NODE=M001M;LINKAGE=D

[14] From ω-ρ interference in the $\pi^+ \pi^-$ mass spectrum assuming ω width 12.6 MeV. NODE=M001M;LINKAGE=F



$\omega(782)$ WIDTH

NODE=M001W

NODE=M001W

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
8.68±0.13 OUR AVERAGE					
8.68±0.23±0.10	11200	[1] AKHMETSHIN	04	CMD2	$e^+e^- \to \pi^+\pi^-\pi^0$
8.68±0.04±0.15	1.2M	[2] ACHASOV	03D	RVUE	0.44–2.00 $e^+e^- \to \pi^+\pi^-\pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
8.57±0.06	34M	[3] IGNATOV	24	CMD3	$e^+e^- \to \pi^+\pi^-$
8.65±0.06±0.01		[4] HOID	20	RVUE	$e^+e^- \to \pi^0\gamma$
8.71±0.04±0.04		[5] HOFERICHT...	19	RVUE	$e^+e^- \to \pi^+\pi^-\pi^0$
8.13±0.45		[6] LEES	12G	BABR	$e^+e^- \to \pi^+\pi^-\gamma$
8.2 ±0.3	19500	[7] WURZINGER	95	SPEC	1.33 $pd \to {}^3\mathrm{He}\,\omega$
8.4 ±0.1		[8] AULCHENKO	87	ND	$e^+e^- \to \pi^+\pi^-\pi^0$
8.30±0.40		[7] BARKOV	87	CMD	$e^+e^- \to \pi^+\pi^-\pi^0$
9.8 ±0.9	1488	[9] KURDADZE	83B	OLYA	$e^+e^- \to \pi^+\pi^-\pi^0$
9.0 ±0.8	433	[7] CORDIER	80	DM1	$e^+e^- \to \pi^+\pi^-\pi^0$
12 ±2	1430	COOPER	78B	HBC	0.7–0.8 $\overline{p}p \to 5\pi$
9.4 ±2.5	2100	GESSAROLI	77	HBC	11 $\pi^- p \to \omega n$
10.22±0.43	20000	[10] KEYNE	76	CNTR	$\pi^- p \to \omega n$
13.3 ±2	418	AGUILAR-...	72B	HBC	3.9,4.6 $K^- p$
9.1 ±0.8	451	[7] BENAKSAS	72B	OSPK	$e^+e^- \to \pi^+\pi^-\pi^0$
10.5 ±1.5		BORENSTEIN	72	HBC	2.18 $K^- p$
7.70±0.9 ±1.15	940	BROWN	72	MMS	2.5 $\pi^- p \to n\,\mathrm{MM}$
10.3 ±1.4	510	BIZZARRI	71	HBC	0.0 $p\overline{p} \to K_1 K_1 \omega$
12.8 ±3.0	248	BIZZARRI	71	HBC	0.0 $p\overline{p} \to K^+K^-\omega$
9.5 ±1.0	3583	COYNE	71	HBC	3.7 $\pi^+ p \to p\pi^+\pi^+\pi^-\pi^0$

OCCUR=2

[1] Update of AKHMETSHIN 00C. NODE=M001W;LINKAGE=PT

[2] From the combined fit of ANTONELLI 92, ACHASOV 01E, ACHASOV 02E, and ACHASOV 03D data on the $\pi^+\pi^-\pi^0$ and ANTONELLI 92 on the $\omega\pi^+\pi^-$ final states. Supersedes ACHASOV 99E and ACHASOV 02E. NODE=M001W;LINKAGE=VH

[3] From a fit of the pion form factor in the energy range $0.32 < \sqrt{s} < 1.2$ GeV using the GOUNARIS 68 parametrization with the complex phase of the $\rho-\omega$ interference leaving $\rho(1450)$, $\rho(1700)$ resonances as free parameters of the fit. Systematic errors not estimated. NODE=M001W;LINKAGE=H

[4] The values were extracted from a dispersively improved Breit-Wigner parameterization and do not include vacuum polarization. Inclusion of vacuum polarization gives 8.63 ± 0.05 MeV. NODE=M001W;LINKAGE=E

[5] The values were extracted from a dispersively improved Breit-Wigner parameterization and do not include vacuum polarization. NODE=M001W;LINKAGE=F

[6] From the $\rho-\omega$ interference in the $\pi^+\pi^-$ mass spectrum using the Breit-Wigner for the ω and leaving its mass and width as free parameters of the fit. NODE=M001W;LINKAGE=LE

[7] Systematic uncertainties underestimated. NODE=M001W;LINKAGE=I

[8] Relativistic Breit-Wigner includes radiative corrections. Systematic uncertainties not estimated. NODE=M001W;LINKAGE=G
[9] Systematic uncertainties not estimated. NODE=M001W;LINKAGE=J
[10] Observed by threshold-crossing technique. Mass resolution = 4.8 MeV FWHM. NODE=M001W;LINKAGE=B

$\omega(782)$ DECAY MODES

NODE=M001215;NODE=M001

	Mode		Fraction (Γ_i/Γ)	Scale factor/ Confidence level	
Γ_1	$\pi^+\pi^-\pi^0$		$(89.2\ \pm0.7\ )$ %		DESIG=1
Γ_2	$\pi^0\gamma$		$(\ 8.33\pm0.25)$ %	S=2.1	DESIG=3
Γ_3	$\pi^+\pi^-$		$(\ 1.53\pm0.12)$ %	S=1.2	DESIG=2
Γ_4	neutrals (excluding $\pi^0\gamma$)		$(\ 7\ \ {}^{+7}_{-5}\ ) \times 10^{-3}$	S=1.1	DESIG=13
Γ_5	$\eta\gamma$		$(\ 4.5\ \pm0.4\ ) \times 10^{-4}$	S=1.1	DESIG=6
Γ_6	$\pi^0 e^+ e^-$		$(\ 7.7\ \pm0.6\ ) \times 10^{-4}$		DESIG=14
Γ_7	$\pi^0\mu^+\mu^-$		$(\ 1.34\pm0.18) \times 10^{-4}$	S=1.5	DESIG=11
Γ_8	$\eta e^+ e^-$				DESIG=18
Γ_9	$e^+ e^-$		$(\ 7.41\pm0.19) \times 10^{-5}$	S=1.8	DESIG=7
Γ_{10}	$\pi^+\pi^-\pi^0\pi^0$		$<\ 2 \times 10^{-4}$	CL=90%	DESIG=12
Γ_{11}	$\pi^+\pi^-\gamma$		$<\ 3.6 \times 10^{-3}$	CL=95%	DESIG=4
Γ_{12}	$\pi^+\pi^-\pi^+\pi^-$		$<\ 1 \times 10^{-3}$	CL=90%	DESIG=15
Γ_{13}	$\pi^0\pi^0\gamma$		$(\ 6.7\ \pm1.1\ ) \times 10^{-5}$		DESIG=5
Γ_{14}	$\eta\pi^0\gamma$		$<\ 3.3 \times 10^{-5}$	CL=90%	DESIG=17
Γ_{15}	$\mu^+\mu^-$		$(\ 7.4\ \pm1.8\ ) \times 10^{-5}$		DESIG=8
Γ_{16}	3γ		$<\ 1.9 \times 10^{-4}$	CL=95%	DESIG=10
	Charge conjugation (C) violating modes				NODE=M001;CLUMP=A
Γ_{17}	$\eta\pi^0$	C	$<\ 2.1 \times 10^{-4}$	CL=90%	DESIG=9
Γ_{18}	$2\pi^0$	C	$<\ 2.2 \times 10^{-4}$	CL=90%	DESIG=193
Γ_{19}	$3\pi^0$	C	$<\ 2.3 \times 10^{-4}$	CL=90%	DESIG=16
Γ_{20}	invisible		$<\ 7 \times 10^{-5}$	CL=90%	DESIG=194

CONSTRAINED FIT INFORMATION

An overall fit to 15 branching ratios uses 49 measurements and one constraint to determine 10 parameters. The overall fit has a $\chi^2 = 48.9$ for 40 degrees of freedom.

The following *off-diagonal* array elements are the correlation coefficients $\left\langle\delta x_i\delta x_j\right\rangle/(\delta x_i\cdot\delta x_j)$, in percent, from the fit to 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_2	24								
x_3	−18	−4							
x_4	−93	−55	1						
x_5	7	16	−1	−12					
x_6	−1	0	0	0	0				
x_7	0	0	0	0	0	0			
x_9	−28	−59	5	44	−28	0	0		
x_{13}	1	4	0	−2	1	0	0	−2	
x_{15}	0	0	0	0	0	0	0	0	0
	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_9	x_{13}

$\omega(782)$ PARTIAL WIDTHS

NODE=M001218

$\Gamma(\pi^0\gamma)$ Γ_2

NODE=M001W1

VALUE (keV)	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
880±50	7815	[1] ACHASOV	13	SND	1.05–2.00 $e^+e^- \to \pi^0\pi^0\gamma$
788±12±27	36500	[2] ACHASOV	03	SND	0.60–0.97 $e^+e^- \to \pi^0\gamma$
764±51	10625	DOLINSKY	89	ND	$e^+e^- \to \pi^0\gamma$

NODE=M001W1

[1] Systematic uncertainty not estimated. NODE=M001W1;LINKAGE=AC
[2] Using $\Gamma_\omega = 8.44 \pm 0.09$ MeV and B($\omega \to \pi^0\gamma$) from ACHASOV 03. NODE=M001W1;LINKAGE=AD

$\Gamma(\eta\gamma)$ — Γ_5

NODE=M001W2

VALUE (keV)	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
6.1 ± 2.5	[1] DOLINSKY 89	ND	$e^+e^- \to \eta\gamma$

[1] Using $\Gamma_\omega = 8.4 \pm 0.1$ MeV and B($\omega \to \eta\gamma$) from DOLINSKY 89.

NODE=M001W2;LINKAGE=DA

$\Gamma(e^+e^-)$ — Γ_9

NODE=M001W7

VALUE (keV)	EVTS	DOCUMENT ID	TECN	COMMENT
0.60 ±0.02 OUR EVALUATION				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.591 ± 0.015	11200	[1,2] AKHMETSHIN 04	CMD2	$e^+e^- \to \pi^+\pi^-\pi^0$
$0.653\pm0.003\pm0.021$	1.2M	[3] ACHASOV 03D	RVUE	0.44–2.00 $e^+e^- \to \pi^+\pi^-\pi^0$
0.600 ± 0.031	10625	DOLINSKY 89	ND	$e^+e^- \to \pi^0\gamma$

→ UNCHECKED ←

[1] Using B($\omega \to \pi^+\pi^-\pi^0$) = 0.891 ± 0.007 and $\Gamma_{total} = 8.44 \pm 0.09$ MeV.

NODE=M001W7;LINKAGE=3P

[2] Update of AKHMETSHIN 00C.

NODE=M001W7;LINKAGE=PT

[3] Using ACHASOV 03, ACHASOV 03D and B($\omega \to \pi^+\pi^-$) = (1.70 ± 0.28)%.

NODE=M001W;LINKAGE=VF

$\omega(782)$ $\Gamma(i)\Gamma(e^+e^-)/\Gamma(total)$

NODE=M001235

$\Gamma(\pi^+\pi^-\pi^0) \times \Gamma(e^+e^-)/\Gamma_{total}$ — $\Gamma_1\Gamma_9/\Gamma$

NODE=M001R02

VALUE (eV)	DOCUMENT ID	TECN	COMMENT
569.8±3.1±8.2	[1] LEES 21B	BABR	10.5 $e^+e^- \to \pi^+\pi^-\pi^0\gamma$

[1] From the cross section for $e^+e^- \to \pi^+\pi^-\pi^0$ with contributions from $\rho(770)$, $\omega(782)$, $\phi(1020)$, $\omega(1420)$, and $\omega(1650)$.

NODE=M001R02;LINKAGE=A

$\omega(782)$ $\Gamma(e^+e^-)\Gamma(i)/\Gamma^2(total)$

NODE=M001225

$\Gamma(e^+e^-)/\Gamma_{total} \times \Gamma(\pi^+\pi^-\pi^0)/\Gamma_{total}$ — $\Gamma_9/\Gamma \times \Gamma_1/\Gamma$

NODE=M001G2

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
6.61±0.16 OUR FIT Error includes scale factor of 2.0.				
6.45±0.15 OUR AVERAGE Error includes scale factor of 1.5. See the ideogram below.				
$6.82\pm0.04\pm0.23$	123k	[1] IGNATOV 24	CMD3	$e^+e^- \to \pi^+\pi^-\pi^0$
$6.24\pm0.11\pm0.08$	11.2k	[2] AKHMETSHIN 04	CMD2	$e^+e^- \to \pi^+\pi^-\pi^0$
$6.74\pm0.04\pm0.24$	1.2M	[3,4] ACHASOV 03D	RVUE	0.44–2.00 $e^+e^- \to \pi^+\pi^-\pi^0$
6.37 ± 0.35		[3] DOLINSKY 89	ND	$e^+e^- \to \pi^+\pi^-\pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
6.20 ± 0.13		[5] BENAYOUN 10	RVUE	0.4–1.05 e^+e^-
$6.70\pm0.06\pm0.27$		[6] AUBERT,B 04N	BABR	10.6 $e^+e^- \to \pi^+\pi^-\pi^0\gamma$
6.45 ± 0.24		[7] BARKOV 87	CMD	$e^+e^- \to \pi^+\pi^-\pi^0$
5.79 ± 0.42	1488	[8] KURDADZE 83B	OLYA	$e^+e^- \to \pi^+\pi^-\pi^0$
5.89 ± 0.54	433	[7] CORDIER 80	DM1	$e^+e^- \to \pi^+\pi^-\pi^0$
7.54 ± 0.84	451	[7] BENAKSAS 72B	OSPK	$e^+e^- \to \pi^+\pi^-\pi^0$

[1] From a fit of the cross section using a VMD model which includes the interference of the ω and ϕ and non-resonant background, with some parameters, including ϕ mass and width, fixed at their PDG 22 values.

NODE=M001G2;LINKAGE=D

[2] Update of AKHMETSHIN 00C.

NODE=M001G;LINKAGE=PT

[3] Recalculated by us from the cross section in the peak.

NODE=M001G;LINKAGE=LP

[4] From the combined fit of ANTONELLI 92, ACHASOV 01E, ACHASOV 02E, and ACHASOV 03D data on the $\pi^+\pi^-\pi^0$ and ANTONELLI 92 on the $\omega\pi^+\pi^-$ final states. Supersedes ACHASOV 99E and ACHASOV 02E.

NODE=M001G;LINKAGE=VH

[5] A simultaneous fit of $e^+e^- \to \pi^+\pi^-$, $\pi^+\pi^-\pi^0$, $\pi^0\gamma$, $\eta\gamma$ data.

NODE=M001G2;LINKAGE=BE

[6] Superseeded by LEES 21B.

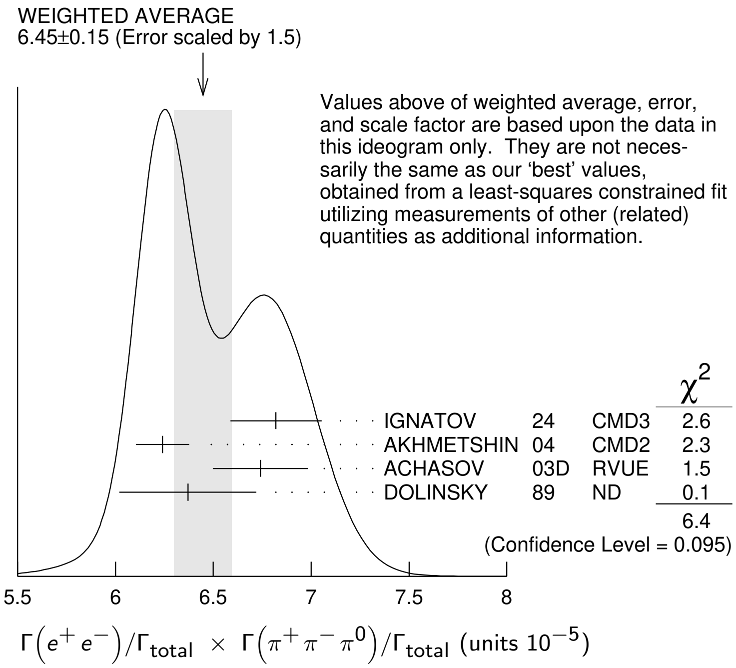
NODE=M001G2;LINKAGE=C

[7] Recalculated by us from the cross section in the peak. Systematic uncertainties underestimated.

NODE=M001G2;LINKAGE=A

[8] Recalculated by us from the cross section in the peak. Systematic uncertainties not estimated.

NODE=M001G2;LINKAGE=B



$\Gamma(e^+e^-)/\Gamma_{\rm total} \times \Gamma(\pi^0\gamma)/\Gamma_{\rm total}$ — $\Gamma_9/\Gamma \times \Gamma_2/\Gamma$

NODE=M001G4
NODE=M001G4

VALUE (units 10^{-6})	EVTS	DOCUMENT ID	TECN	COMMENT
6.17 ±0.16 OUR FIT Error includes scale factor of 2.0.				
6.34 ±0.10 OUR AVERAGE				
6.336±0.056±0.089		[1] ACHASOV 16A	SND	0.60–1.38 $e^+e^- \rightarrow \pi^0\gamma$
6.47 ±0.14 ±0.39	18k	AKHMETSHIN 05	CMD2	0.60-1.38 $e^+e^- \rightarrow \pi^0\gamma$
6.34 ±0.21 ±0.21	10k	[2] DOLINSKY 89	ND	$e^+e^- \rightarrow \pi^0\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
6.80 ±0.13		[3] BENAYOUN 10	RVUE	0.4–1.05 e^+e^-
6.50 ±0.11 ±0.20	36k	[4] ACHASOV 03	SND	0.60–0.97 $e^+e^- \rightarrow \pi^0\gamma$

[1] From the VMD model with the interfering $\rho(770)$, $\omega(782)$, $\phi(1020)$, and an additional resonance describing the total contribution of the $\rho(1450)$ and $\omega(1420)$ states. Supersedes ACHASOV 03. NODE=M001G4;LINKAGE=A

[2] Recalculated by us from the cross section in the peak. NODE=M001G4;LINKAGE=LP

[3] A simultaneous fit of $e^+e^- \rightarrow \pi^+\pi^-$, $\pi^+\pi^-\pi^0$, $\pi^0\gamma$, $\eta\gamma$ data. NODE=M001G4;LINKAGE=BE

[4] Using $\sigma(\phi \rightarrow \pi^0\gamma)$ from ACHASOV 00 and $m_\omega = 782.57$ MeV in the model with the energy-independent phase of ρ-ω interferenceequal to $(-10.2 \pm 7.0)^\circ$. NODE=M001G;LINKAGE=SH

$\Gamma(e^+e^-)/\Gamma_{\rm total} \times \Gamma(\pi^+\pi^-)/\Gamma_{\rm total}$ — $\Gamma_9/\Gamma \times \Gamma_3/\Gamma$

NODE=M001G5
NODE=M001G5

VALUE (units 10^{-6})	EVTS	DOCUMENT ID	TECN	COMMENT
1.225±0.030 OUR AVERAGE Error includes scale factor of 1.3. See the ideogram below.				
1.204±0.013±0.023	34M	[1] IGNATOV 24	CMD3	$e^+e^- \rightarrow \pi^+\pi^-$
1.318±0.051±0.021		[2] ACHASOV 21	SND	$e^+e^- \rightarrow \pi^+\pi^-$
1.225±0.058±0.041	800k	[3] ACHASOV 06	SND	$e^+e^- \rightarrow \pi^+\pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1.166±0.036		[4] BENAYOUN 13	RVUE	0.4–1.05 e^+e^-
1.05 ±0.08		[5] DAVIER 13	RVUE	$e^+e^- \rightarrow \pi^+\pi^-(\gamma)$

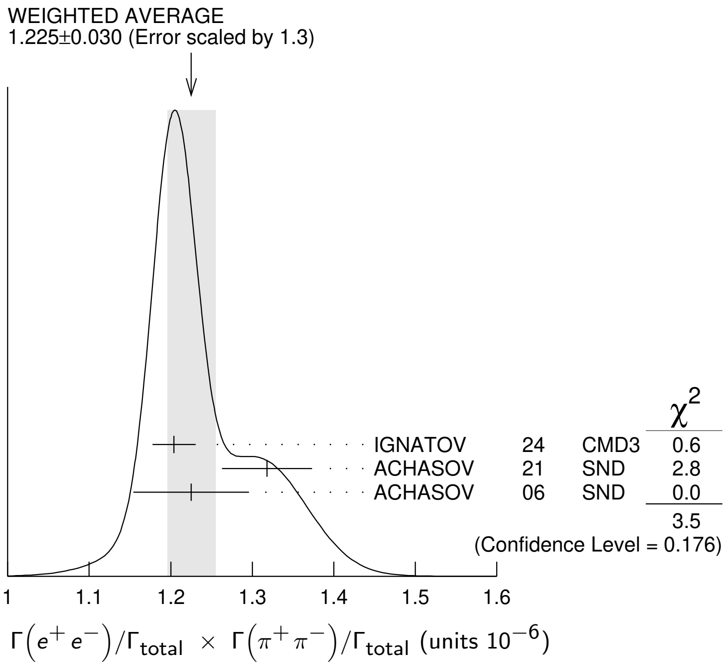
[1] From a fit of the pion form factor in the energy range $0.32 < \sqrt{s} < 1.2$ GeV using the GOUNARIS 68 parametrization with the complex phase of the $\rho-\omega$ interference with ω and ϕ masses and widths constrained by the values and their errors from PDG 22, and leaving $\rho(1450)$, $\rho(1700)$ resonances as free parameters of the fit. NODE=M001G5;LINKAGE=E

[2] From a fit of the cross section in the energy range $0.525 < \sqrt{s} < 0.883$ GeV parameterized by the sum of the Breit-Wigner amplitudes for the $\rho(770)$, ω and $\rho(1450)$ resonances. The measured phase of the $\rho(770)$—ω interference is $(110.7 \pm 1.5 \pm 1.0)^\circ$. NODE=M001G5;LINKAGE=C

[3] Supersedes ACHASOV 05A. NODE=M001G5;LINKAGE=AC

[4] A simultaneous fit to $e^+e^- \rightarrow \pi^+\pi^-$, $\pi^+\pi^-\pi^0$, $\pi^0\gamma$, $\eta\gamma$, $K\overline{K}$, and $\tau^- \rightarrow \pi^-\pi^0\nu_\tau$ data. Supersedes BENAYOUN 10. NODE=M001G5;LINKAGE=B

[5] From $e^+e^- \rightarrow \pi^+\pi^-(\gamma)$ data of LEES 12G. NODE=M001G5;LINKAGE=A



$\Gamma(e^+e^-)/\Gamma_{total} \times \Gamma(\eta\gamma)/\Gamma_{total}$ $\Gamma_9/\Gamma \times \Gamma_5/\Gamma$

NODE=M001G3
NODE=M001G3

VALUE (units 10^{-8})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
3.32±0.28 OUR FIT	Error includes scale factor of 1.1.				
3.18±0.28 OUR AVERAGE					
$3.10 \pm 0.31 \pm 0.11$	33k	[1] ACHASOV	07B	SND	0.6–1.38 $e^+e^- \to \eta\gamma$
$3.17^{+1.85}_{-1.31} \pm 0.21$	17.4k	[2] AKHMETSHIN	05	CMD2	0.60-1.38 $e^+e^- \to \eta\gamma$
$3.41 \pm 0.52 \pm 0.21$	23k	[3,4] AKHMETSHIN	01B	CMD2	$e^+e^- \to \eta\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
4.50 ± 0.10		[5] BENAYOUN	10	RVUE	0.4–1.05 e^+e^-

[1] From a combined fit of $\sigma(e^+e^- \to \eta\gamma)$ with $\eta \to 3\pi^0$ and $\eta \to \pi^+\pi^-\pi^0$, and fixing $B(\eta \to 3\pi^0)$ / $B(\eta \to \pi^+\pi^-\pi^0) = 1.44 \pm 0.04$. Recalculated by us from the cross section at the peak. Supersedes ACHASOV 00D and ACHASOV 06A. NODE=M001G3;LINKAGE=AH

[2] From the $\eta \to 2\gamma$ decay and using $B(\eta \to \gamma\gamma) = 39.43 \pm 0.26\%$. NODE=M001G;LINKAGE=AH

[3] From the $\eta \to 3\pi^0$ decay and using $B(\eta \to 3\pi^0) = (32.24 \pm 0.29) \times 10^{-2}$. NODE=M001G;LINKAGE=AK

[4] The combined fit from 600 to 1380 MeV taking into account $\rho(770)$, $\omega(782)$, $\phi(1020)$, and $\rho(1450)$ (mass and width fixed at 1450 MeV and 310 MeV respectively). NODE=M001G;LINKAGE=BQ

[5] A simultaneous fit of $e^+e^- \to \pi^+\pi^-$, $\pi^+\pi^-\pi^0$, $\pi^0\gamma$, $\eta\gamma$ data. NODE=M001G3;LINKAGE=BE

$\Gamma(e^+e^-)/\Gamma_{total} \times \Gamma(\mu^+\mu^-)/\Gamma_{total}$ $\Gamma_9/\Gamma \times \Gamma_{15}/\Gamma$

NODE=M001G01
NODE=M001G01

VALUE (units 10^{-9})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
4.3±1.8±2.2	4.5M	[1] ANASTASI	17	KLOE	$e^+e^- \to \mu^+\mu^-\gamma$

[1] From a fit of the real part of the vacuum polarization by a sum of the leptonic and hadronic contributions, where the hadronic contribution is parametrized as a sum of Breit-Wigner resonances $\omega(782)$, $\phi(1020)$ and using a GOUNARIS 68 parametrization for the $\rho(770)$, and a non-resonant term. NODE=M001G01;LINKAGE=A

$\omega(782)$ BRANCHING RATIOS

NODE=M001220

$\Gamma(\pi^+\pi^-\pi^0)/\Gamma_{total}$ Γ_1/Γ

NODE=M001R21

NIECKNIG 12 describes final-state interactions between the three pions in a dispersive framework using data on the $\pi\pi$ P-wave scattering phase shift. NODE=M001R21

NODE=M001R21

VALUE	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.9024 ± 0.0019		[1] AMBROSINO	08G	KLOE	1.0–1.03 $e^+e^- \to \pi^+\pi^-2\pi^0$, $2\pi^0\gamma$
$0.8965 \pm 0.0016 \pm 0.0048$	1.2M	[2,3] ACHASOV	03D	RVUE	0.44–2.00 $e^+e^- \to \pi^+\pi^-\pi^0$
$0.880 \pm 0.020 \pm 0.032$	11200	[3,4] AKHMETSHIN	00C	CMD2	$e^+e^- \to \pi^+\pi^-\pi^0$
0.8942 ± 0.0062		[3] DOLINSKY	89	ND	$e^+e^- \to \pi^+\pi^-\pi^0$

[1] Not independent of $\Gamma(\pi^0\gamma)$ / $\Gamma(\pi^+\pi^-\pi^0)$ from AMBROSINO 08G. NODE=M001R21;LINKAGE=AM

[2] Using ACHASOV 03, ACHASOV 03D and $B(\omega \to \pi^+\pi^-) = (1.70 \pm 0.28)\%$. NODE=M001R;LINKAGE=VF

[3] Not independent of the corresponding $\Gamma(e^+e^-) \times \Gamma(\pi^+\pi^-\pi^0)/\Gamma^2_{total}$. NODE=M001R;LINKAGE=ZL

[4] Using $\Gamma(e^+e^-) = 0.60 \pm 0.02$ keV. NODE=M001R;LINKAGE=KH

$\Gamma(\pi^0\gamma)/\Gamma_{total}$ — Γ_2/Γ

NODE=M001R28
NODE=M001R28

VALUE (units 10^{-2})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •					
8.88 ± 0.18		[1] ACHASOV	16A	SND	0.60–1.38 $e^+e^- \to \pi^0\gamma$
8.09 ± 0.14		[2] AMBROSINO	08G	KLOE	$e^+e^- \to \pi^+\pi^-2\pi^0$, $2\pi^0\gamma$
$9.06\pm0.20\pm0.57$	18k	[3,4] AKHMETSHIN	05	CMD2	0.60-1.38 $e^+e^- \to \pi^0\gamma$
$9.34\pm0.15\pm0.31$	36k	[4] ACHASOV	03	SND	0.60–0.97 $e^+e^- \to \pi^0\gamma$
$8.65\pm0.16\pm0.42$	1.2M	[5,6] ACHASOV	03D	RVUE	0.44–2.00 $e^+e^- \to \pi^+\pi^-\pi^0$
8.39 ± 0.24	9k	[7] BENAYOUN	96	RVUE	$e^+e^- \to \pi^0\gamma$
8.88 ± 0.62	10k	[4] DOLINSKY	89	ND	$e^+e^- \to \pi^0\gamma$

[1] Using B($\omega \to e^+e^-$) from PDG 15. Supersedes ACHASOV 03. NODE=M001R28;LINKAGE=A

[2] Not independent of $\Gamma(\pi^0\gamma)$ / $\Gamma(\pi^+\pi^-\pi^0)$ from AMBROSINO 08G. NODE=M001R28;LINKAGE=AM

[3] Using B($\omega \to e^+e^-$)$= (7.14 \pm 0.13) \times 10^{-5}$. NODE=M001R;LINKAGE=AH

[4] Not independent of the corresponding $\Gamma(e^+e^-) \times \Gamma(\pi^0\gamma)/\Gamma^2_{total}$. NODE=M001R;LINKAGE=VL

[5] Using ACHASOV 03, ACHASOV 03D and B($\omega \to \pi^+\pi^-$) $= (1.70 \pm 0.28)$%. NODE=M001R28;LINKAGE=VF

[6] Not independent of the corresponding $\Gamma(e^+e^-) \times \Gamma(\pi^+\pi^-\pi^0)/\Gamma^2_{total}$. NODE=M001R28;LINKAGE=ZL

[7] Reanalysis of DRUZHININ 84, DOLINSKY 89, DOLINSKY 91 taking into account the triangle anomaly contributions. NODE=M001R28;LINKAGE=A1

$\Gamma(\pi^0\gamma)/\Gamma(\pi^+\pi^-\pi^0)$ — Γ_2/Γ_1

NODE=M001R3
NODE=M001R3

VALUE (units 10^{-2})	*DOCUMENT ID*		*TECN*	*COMMENT*
9.33 ± 0.28 OUR FIT Error includes scale factor of 2.3.				
9.05 ± 0.27 OUR AVERAGE Error includes scale factor of 1.8.				
8.97 ± 0.16	AMBROSINO	08G	KLOE	$e^+e^- \to \pi^+\pi^-2\pi^0$, $2\pi^0\gamma$
$9.94\pm0.36\pm0.38$	[1] AULCHENKO	00A	SND	$e^+e^- \to \pi^+\pi^-2\pi^0$, $2\pi^0\gamma$
$8.4\ \pm1.3$	KEYNE	76	CNTR	$\pi^-p \to \omega n$
$10.9\ \pm2.5$	BENAKSAS	72C	OSPK	$e^+e^- \to \pi^0\gamma$
$8.1\ \pm2.0$	BALDIN	71	HLBC	2.9 π^+p
$13\ \pm4$	JACQUET	69B	HLBC	2.05 $\pi^+p \to \pi^+p\omega$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$9.7\ \pm0.2\ \pm0.5$	[2,3] ACHASOV	03D	RVUE	0.44–2.00 $e^+e^- \to \pi^+\pi^-\pi^0$
$9.9\ \pm0.7$	[2] DOLINSKY	89	ND	$e^+e^- \to \pi^0\gamma$

[1] From $\sigma_0^{\omega\pi^0 \to \pi^0\pi^0\gamma}(m_\phi)/\sigma_0^{\omega\pi^0 \to \pi^+\pi^-\pi^0\pi^0}(m_\phi)$ with a phase-space correction factor of 1/1.023. NODE=M001R3;LINKAGE=AL

[2] Not independent of the corresponding $\Gamma(e^+e^-) \times \Gamma(\pi^0\gamma)/\Gamma^2_{total}$. NODE=M001R3;LINKAGE=VL

[3] Using ACHASOV 03. Based on 1.2M events. NODE=M001R3;LINKAGE=VW

$\Gamma(\pi^+\pi^-)/\Gamma_{total}$ — Γ_3/Γ

NODE=M001R15

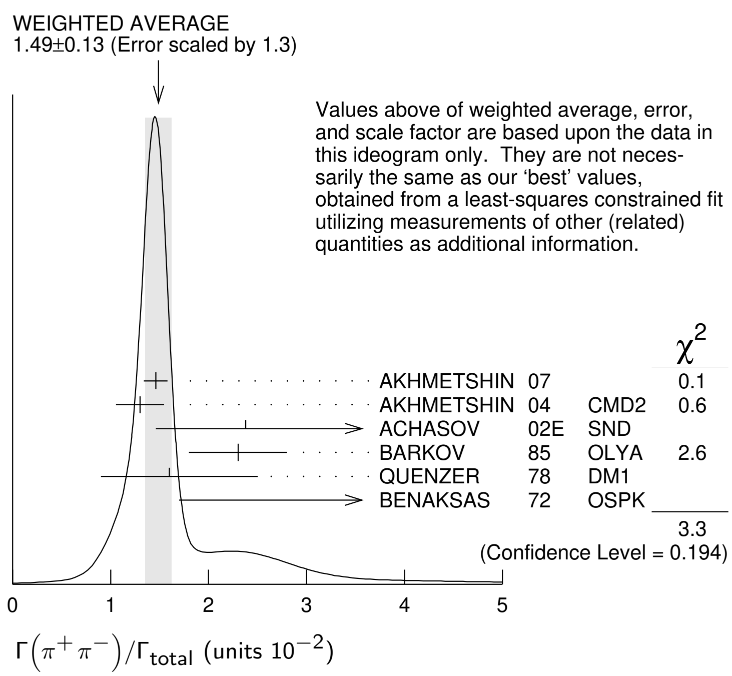
See also $\Gamma(\pi^+\pi^-)/\Gamma(\pi^+\pi^-\pi^0)$.

NODE=M001R15
NODE=M001R15

VALUE (units 10^{-2})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
1.53 ± 0.12 OUR FIT Error includes scale factor of 1.2.					
1.49 ± 0.13 OUR AVERAGE Error includes scale factor of 1.3. See the ideogram below.					
$1.46\pm0.12\pm0.02$	900k	[1] AKHMETSHIN	07		$e^+e^- \to \pi^+\pi^-$
$1.30\pm0.24\pm0.05$	11.2k	[2] AKHMETSHIN	04	CMD2	$e^+e^- \to \pi^+\pi^-$
$2.38^{+1.77}_{-0.90}\pm0.18$	5.4k	[3] ACHASOV	02E	SND	1.1–1.38 $e^+e^- \to \pi^+\pi^-\pi^0$
$2.3\ \pm0.5$		BARKOV	85	OLYA	$e^+e^- \to \pi^+\pi^-$
$1.6\ ^{+0.9}_{-0.7}$		QUENZER	78	DM1	$e^+e^- \to \pi^+\pi^-$
$3.6\ \pm1.9$		BENAKSAS	72	OSPK	$e^+e^- \to \pi^+\pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$1.29\pm0.22\pm0.03$	970k	[4,5] ABLIKIM	18C	BES3	$\eta'(958) \to \gamma\pi^+\pi^-$
$1.28\pm0.22\pm0.03$	970k	[6,7] ABLIKIM	18C	BES3	$\eta'(958) \to \gamma\pi^+\pi^-$
1.52 ± 0.08		[8] HANHART	18	RVUE	$e^+e^- \to \pi^+\pi^-$
1.75 ± 0.11	4.5M	[9] ACHASOV	05A	SND	$e^+e^- \to \pi^+\pi^-$
2.01 ± 0.29		[10] BENAYOUN	03	RVUE	$e^+e^- \to \pi^+\pi^-$
$1.9\ \pm0.3$		[11] GARDNER	99	RVUE	$e^+e^- \to \pi^+\pi^-$
$2.3\ \pm0.4$		[12] BENAYOUN	98	RVUE	$e^+e^- \to \pi^+\pi^-$, $\mu^+\mu^-$
$1.0\ \pm0.11$		[13] WICKLUND	78	ASPK	3,4,6 $\pi^\pm N$
1.22 ± 0.30		ALVENSLEB...	71C	CNTR	Photoproduction
$1.3\ ^{+1.2}_{-0.9}$		MOFFEIT	71	HBC	2.8,4.7 γp
$0.80^{+0.28}_{-0.20}$		[14] BIGGS	70B	CNTR	4.2 γC $\to \pi^+\pi^-$C

OCCUR=3
OCCUR=2

[1] A combined fit of AKHMETSHIN 07, AULCHENKO 06, and AULCHENKO 05. NODE=M001R15;LINKAGE=AK
[2] Update of AKHMETSHIN 02. NODE=M001R15;LINKAGE=PT
[3] From the $m_{\pi^+\pi^-}$ spectrum taking into account the interference of the $\rho\pi$ and $\omega\pi$ amplitudes. NODE=M001R;LINKAGE=VE
[4] From a fit to $\pi^+\pi^-$ mass using $\rho(770)$ (parametrized with the Gounaris-Sakurai approach), $\omega(782)$, and box anomaly components. NODE=M001R15;LINKAGE=E
[5] ABLIKIM 18C reports $[\Gamma(\omega(782) \to \pi^+\pi^-)/\Gamma_{total}] \times [B(\eta'(958) \to \omega\gamma)] = (3.25 \pm 0.21 \pm 0.52) \times 10^{-4}$ which we divide by our best value $B(\eta'(958) \to \omega\gamma) = (2.52 \pm 0.07) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. NODE=M001R15;LINKAGE=H
[6] From a fit to $\pi^+\pi^-$ mass using $\rho(770)$ (parametrized with the Gounaris-Sakurai approach), $\omega(782)$, and $\rho(1450)$ components. NODE=M001R15;LINKAGE=J
[7] ABLIKIM 18C reports $[\Gamma(\omega(782) \to \pi^+\pi^-)/\Gamma_{total}] \times [B(\eta'(958) \to \omega\gamma)] = (3.22 \pm 0.21 \pm 0.52) \times 10^{-4}$ which we divide by our best value $B(\eta'(958) \to \omega\gamma) = (2.52 \pm 0.07) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. NODE=M001R15;LINKAGE=K
[8] Dispersive analysis. Value extracted from average of data from AUBERT 09AS, AKHMETSHIN 07, ACHASOV 06, AMBROSINO 11A, BABUSCI 13D, ABLIKIM 16B normalised by PDG 16 evaluation for $\Gamma(\omega \to e^+e^-)$. NODE=M001R15;LINKAGE=D
[9] Using $\Gamma(\omega \to e^+e^-)$ from the 2004 Edition of this Review (PDG 04). NODE=M001R;LINKAGE=SN
[10] Using the data of AKHMETSHIN 02 in the hidden local symmetry model. NODE=M001R;LINKAGE=BY
[11] Using the data of BARKOV 85. NODE=M001R15;LINKAGE=H4
[12] Using the data of BARKOV 85 in the hidden local symmetry model. NODE=M001R15;LINKAGE=Q
[13] From a model-dependent analysis assuming complete coherence. NODE=M001R15;LINKAGE=F
[14] Re-evaluated under $\Gamma(\pi^+\pi^-)/\Gamma(\pi^+\pi^-\pi^0)$ by BEHREND 71 using more accurate $\omega \to \rho$ photoproduction cross-section ratio. NODE=M001R15;LINKAGE=B



$\Gamma(\pi^+\pi^-)/\Gamma(\pi^+\pi^-\pi^0)$ Γ_3/Γ_1

NODE=M001R2

See also $\Gamma(\pi^+\pi^-)/\Gamma_{total}$. NODE=M001R2

NODE=M001R2

VALUE	DOCUMENT ID		TECN	COMMENT
0.0172±0.0014 OUR FIT Error includes scale factor of 1.2.				
0.026 ±0.005 OUR AVERAGE				
$0.021\ ^{+0.028}_{-0.009}$	[1,2] RATCLIFF	72	ASPK	$15\ \pi^- p \to n 2\pi$
$0.028\ \pm 0.006$	[1] BEHREND	71	ASPK	Photoproduction
$0.022\ ^{+0.009}_{-0.01}$	[3] ROOS	70	RVUE	

[1] The fitted width of these data is 160 MeV in agreement with present average, thus the ω contribution is overestimated. Assuming ρ width 145 MeV. NODE=M001R2;LINKAGE=A
[2] Significant interference effect observed. NB of $\omega \to 3\pi$ comes from an extrapolation. NODE=M001R2;LINKAGE=S
[3] ROOS 70 combines ABRAMOVICH 70 and BIZZARRI 70. NODE=M001R2;LINKAGE=R

$\Gamma(\pi^+\pi^-)/\Gamma(\pi^0\gamma)$ — Γ_3/Γ_2

NODE=M001R33

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.20±0.04	1.98M	[1] ALOISIO	03	KLOE	1.02 $e^+e^- \rightarrow \pi^+\pi^-\pi^0$

[1] Using the data of ALOISIO 02D.

NODE=M001R;LINKAGE=KL

$\Gamma(\text{neutrals})/\Gamma_{\text{total}}$ — $(\Gamma_2+\Gamma_4)/\Gamma$

NODE=M001R14

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.091±0.006 OUR FIT					
0.081±0.011 OUR AVERAGE					
0.075±0.025		BIZZARRI	71	HBC	0.0 $p\overline{p}$
0.079±0.019		DEINET	69B	OSPK	1.5 $\pi^- p$
0.084±0.015		BOLLINI	68C	CNTR	2.1 $\pi^- p$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.073±0.018	42	BASILE	72B	CNTR	1.67 $\pi^- p$

$\Gamma(\text{neutrals})/\Gamma(\pi^+\pi^-\pi^0)$ — $(\Gamma_2+\Gamma_4)/\Gamma_1$

NODE=M001R1

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.102±0.008 OUR FIT					
$0.103^{+0.011}_{-0.010}$ OUR AVERAGE					
0.15 ±0.04	46	AGUILAR-...	72B	HBC	3.9,4.6 $K^- p$
0.10 ±0.03	19	BARASH	67B	HBC	0.0 $\overline{p}p$
0.134±0.026	850	DIGIUGNO	66B	CNTR	1.4 $\pi^- p$
0.097±0.016	348	FLATTE	66	HBC	1.4 – 1.7 $K^- p \rightarrow \Lambda$MM
$0.06\ ^{+0.05}_{-0.02}$		JAMES	66	HBC	2.1 $\pi^+ p$
0.08 ±0.03	35	KRAEMER	64	DBC	1.2 $\pi^+ d$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.11 ±0.02	20	BUSCHBECK	63	HBC	1.5 $K^- p$

$\Gamma(\pi^0\gamma)/\Gamma(\text{neutrals})$ — $\Gamma_2/(\Gamma_2+\Gamma_4)$

NODE=M001R18

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.78±0.07		[1] DAKIN	72	OSPK	1.4 $\pi^- p \rightarrow n$MM
>0.81	90	DEINET	69B	OSPK	

[1] Error statistical only. Authors obtain good fit also assuming $\pi^0\gamma$ as the only neutral decay.

NODE=M001R18;LINKAGE=D

$\Gamma(\text{neutrals})/\Gamma(\text{charged particles})$ — $(\Gamma_2+\Gamma_4)/(\Gamma_1+\Gamma_3)$

NODE=M001R9

VALUE	DOCUMENT ID		TECN	COMMENT
0.100±0.008 OUR FIT				
0.124±0.021	FELDMAN	67C	OSPK	1.2 $\pi^- p$

$\Gamma(\eta\gamma)/\Gamma_{\text{total}}$ — Γ_5/Γ

NODE=M001R19

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
4.5 ±0.4 OUR FIT Error includes scale factor of 1.1.					
6.3 ±1.3 OUR AVERAGE Error includes scale factor of 1.2.					
6.6 ±1.7		[1] ABELE	97E	CBAR	0.0 $\overline{p}p \rightarrow 5\gamma$
8.3 ±2.1		ALDE	93	GAM2	$38\pi^- p \rightarrow \omega n$
$3.0\ ^{+2.5}_{-1.8}$		[2] ANDREWS	77	CNTR	6.7–10 γCu
• • • We do not use the following data for averages, fits, limits, etc. • • •					
4.2 ±0.4 ±0.1	33k	[3] ACHASOV	07B	SND	0.6–1.38 $e^+e^- \rightarrow \eta\gamma$
$4.44^{+2.59}_{-1.83}\pm0.28$	17.4k	[4,5] AKHMETSHIN	05	CMD2	0.60-1.38 $e^+e^- \rightarrow \eta\gamma$
5.10±0.72±0.34	23k	[6] AKHMETSHIN	01B	CMD2	$e^+e^- \rightarrow \eta\gamma$
0.7 to 5.5		[7] CASE	00	CBAR	0.0 $p\overline{p} \rightarrow \eta\eta\gamma$
$6.56^{+2.41}_{-2.55}$	3525	[2,8] BENAYOUN	96	RVUE	$e^+e^- \rightarrow \eta\gamma$
7.3 ±2.9		[2,4] DOLINSKY	89	ND	$e^+e^- \rightarrow \eta\gamma$

[1] No flat $\eta\eta\gamma$ background assumed. NODE=M001R;LINKAGE=EA

[2] Solution corresponding to constructive ω-ρ interference. NODE=M001R19;LINKAGE=A

[3] ACHASOV 07B reports $[\Gamma(\omega(782) \to \eta\gamma)/\Gamma_{total}] \times [B(\omega(782) \to e^+e^-)] = (3.10 \pm 0.31 \pm 0.11) \times 10^{-8}$ which we divide by our best value $B(\omega(782) \to e^+e^-) = (7.41 \pm 0.19) \times 10^{-5}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Supersedes ACHASOV 00D and ACHASOV 06A. NODE=M001R19;LINKAGE=AO

[4] Not independent of the corresponding $\Gamma(e^+e^-) \times \Gamma(\eta\gamma)/\Gamma^2_{total}$. NODE=M001R13;LINKAGE=WL

[5] Using $B(\omega \to e^+e^-) = (7.14 \pm 0.13) \times 10^{-5}$ and $B(\eta \to \gamma\gamma) = 39.43 \pm 0.26\%$. NODE=M001R19;LINKAGE=AK

[6] Using $B(\omega \to e^+e^-) = (7.07 \pm 0.19) \times 10^{-5}$ and using $B(\eta \to 3\pi^0) = (32.24 \pm 0.29) \times 10^{-2}$. Solution corresponding to constructive ω-ρ interference. The combined fit from 600 to 1380 MeV taking into account $\rho(770)$, $\omega(782)$, $\phi(1020)$, and $\rho(1450)$ (mass and width fixed at 1450 MeV and 310 MeV respectively). Not independent of the corresponding $\Gamma(e^+e^-) \times \Gamma(\eta\gamma)/\Gamma^2_{total}$. NODE=M001R19;LINKAGE=TS

[7] Depending on the degree of coherence with the flat $\eta\eta\gamma$ background and using $B(\omega \to \pi^0\gamma) = (8.5 \pm 0.5) \times 10^{-2}$. NODE=M001R;LINKAGE=CS

[8] Reanalysis of DRUZHININ 84, DOLINSKY 89, DOLINSKY 91 taking into account the triangle anomaly contributions. NODE=M001R19;LINKAGE=A1

$\Gamma(\eta\gamma)/\Gamma(\pi^0\gamma)$ Γ_5/Γ_2

NODE=M001R11
NODE=M001R11

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.0098 ± 0.0024	[1] ALDE	93	GAM2	$38\pi^- p \to \omega n$
0.0082 ± 0.0033	[2] DOLINSKY	89	ND	$e^+e^- \to \eta\gamma$
0.010 ± 0.045	APEL	72B	OSPK	4–$8\ \pi^- p \to n 3\gamma$

[1] Model independent determination. NODE=M001R11;LINKAGE=A

[2] Solution corresponding to constructive ω-ρ interference. NODE=M001R11;LINKAGE=K

$\Gamma(\pi^0 e^+e^-)/\Gamma_{total}$ Γ_6/Γ

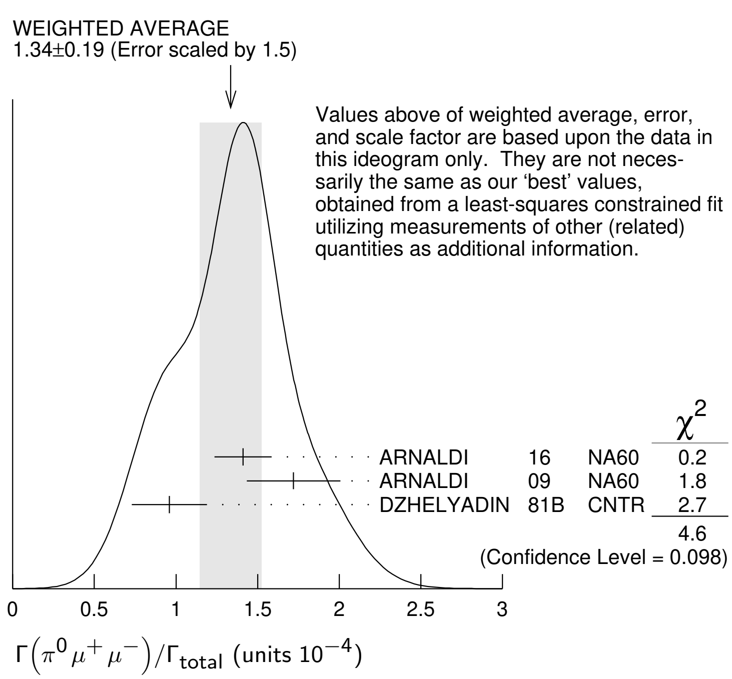
NODE=M001R23
NODE=M001R23

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
7.7 ±0.6 OUR FIT					
7.7 ±0.6 OUR AVERAGE					
$7.61 \pm 0.53 \pm 0.64$		ACHASOV	08	SND	0.36–0.97 $e^+e^- \to \pi^0 e^+e^-$
$8.19 \pm 0.71 \pm 0.62$		AKHMETSHIN	05A	CMD2	0.72-0.84 e^+e^-
5.9 ± 1.9	43	DOLINSKY	88	ND	$e^+e^- \to \pi^0 e^+e^-$

$\Gamma(\pi^0 \mu^+\mu^-)/\Gamma_{total}$ Γ_7/Γ

NODE=M001R12
NODE=M001R12

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
1.34±0.18 OUR FIT Error includes scale factor of 1.5.					
1.34±0.19 OUR AVERAGE Error includes scale factor of 1.5. See the ideogram below.					
$1.41 \pm 0.09 \pm 0.15$		ARNALDI	16	NA60	400 GeV (p-A) collisions
$1.72 \pm 0.25 \pm 0.14$	3k	ARNALDI	09	NA60	158A In−In collisions
0.96 ± 0.23		DZHELYADIN	81B	CNTR	25–33 $\pi^- p \to \omega n$



$\Gamma(\eta e^+ e^-)/\Gamma_{total}$ — Γ_8/Γ

NODE=M001R34

VALUE (units 10^{-5})	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<1.1	AKHMETSHIN	05A	CMD2	0.72-0.84 $e^+ e^-$

$\Gamma(e^+ e^-)/\Gamma_{total}$ — Γ_9/Γ

NODE=M001R13

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
0.741±0.019 OUR FIT	Error includes scale factor of 1.8.				
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.700±0.016	11200	[1,2] AKHMETSHIN	04	CMD2	$e^+ e^- \rightarrow \pi^+ \pi^- \pi^0$
0.752±0.004±0.024	1.2M	[2,3] ACHASOV	03D	RVUE	0.44–2.00 $e^+ e^- \rightarrow \pi^+ \pi^- \pi^0$
0.714±0.036		[2] DOLINSKY	89	ND	$e^+ e^- \rightarrow \pi^+ \pi^- \pi^0$
0.72 ±0.03		[2] BARKOV	87	CMD	$e^+ e^- \rightarrow \pi^+ \pi^- \pi^0$
0.64 ±0.04	1488	[2] KURDADZE	83B	OLYA	$e^+ e^- \rightarrow \pi^+ \pi^- \pi^0$
0.675±0.069	433	[2] CORDIER	80	DM1	$e^+ e^- \rightarrow \pi^+ \pi^- \pi^0$
0.83 ±0.10	451	[2] BENAKSAS	72B	OSPK	$e^+ e^- \rightarrow \pi^+ \pi^- \pi^0$
0.77 ±0.06		[4] AUGUSTIN	69D	OSPK	$e^+ e^- \rightarrow \pi^+ \pi^- \pi^0$
0.65 ±0.13	33	[5] ASTVACAT...	68	OSPK	Assume SU(3)+mixing

[1] Using B($\omega \rightarrow \pi^+ \pi^- \pi^0$) = 0.891 ± 0.007. Update of AKHMETSHIN 00C. NODE=M001R13;LINKAGE=4P

[2] Not independent of the corresponding $\Gamma(e^+ e^-) \times \Gamma(\pi^+ \pi^- \pi^0)/\Gamma^2_{total}$. NODE=M001R13;LINKAGE=ZL

[3] Using ACHASOV 03, ACHASOV 03D and B($\omega \rightarrow \pi^+ \pi^-$) = (1.70 ± 0.28)%. NODE=M001R13;LINKAGE=VF

[4] Rescaled by us to correspond to ω width 8.4 MeV. Systematic errors underestimated. NODE=M001R13;LINKAGE=E

[5] Not resolved from ρ decay. Error statistical only. NODE=M001R13;LINKAGE=A

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

NODE=M001R5

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
< 2	90	ACHASOV	09A	SND	$e^+ e^- \rightarrow \pi^+ \pi^- \pi^0 \pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<200	90	KURDADZE	86	OLYA	$e^+ e^- \rightarrow \pi^+ \pi^- \pi^0 \pi^0$

$\Gamma(\pi^+ \pi^- \gamma)/\Gamma_{total}$ — Γ_{11}/Γ

NODE=M001R22

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0036	95	WEIDENAUER	90	ASTE	$p \overline{p} \rightarrow \pi^+ \pi^- \pi^+ \pi^- \gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.004	95	BITYUKOV	88B	SPEC	32 $\pi^- p \rightarrow \pi^+ \pi^- \gamma X$

$\Gamma(\pi^+ \pi^- \gamma)/\Gamma(\pi^+ \pi^- \pi^0)$ — Γ_{11}/Γ_1

NODE=M001R4

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.066	90	KALBFLEISCH	75	HBC	2.18 $K^- p \rightarrow \Lambda \pi^+ \pi^- \gamma$
<0.05	90	FLATTE	66	HBC	1.2 – 1.7 $K^- p \rightarrow \Lambda \pi^+ \pi^- \gamma$

$\Gamma(\pi^+ \pi^- \pi^+ \pi^-)/\Gamma_{total}$ — Γ_{12}/Γ

NODE=M001R24

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<1 \times 10^{-3}$	90	KURDADZE	88	OLYA	$e^+ e^- \rightarrow \pi^+ \pi^- \pi^+ \pi^-$

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

NODE=M001R29

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
6.7±1.1 OUR FIT					
6.5±1.2 OUR AVERAGE					
$6.4^{+2.4}_{-2.0}\pm0.8$	190	[1] AKHMETSHIN	04B	CMD2	0.6–0.97 $e^+ e^- \rightarrow \pi^0 \pi^0 \gamma$
$6.6^{+1.4}_{-1.3}\pm0.6$	295	ACHASOV	02F	SND	0.36–0.97 $e^+ e^- \rightarrow \pi^0 \pi^0 \gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$11.8^{+2.1}_{-1.9}\pm1.4$	190	[2] AKHMETSHIN	04B	CMD2	0.6–0.97 $e^+ e^- \rightarrow \pi^0 \pi^0 \gamma$ (OCCUR=2)
7.8±2.7±2.0	63	[1,3] ACHASOV	00G	SND	$e^+ e^- \rightarrow \pi^0 \pi^0 \gamma$
12.7±2.3±2.5	63	[2,3] ACHASOV	00G	SND	$e^+ e^- \rightarrow \pi^0 \pi^0 \gamma$ (OCCUR=2)

[1] In the model assuming the $\rho \rightarrow \pi^0 \pi^0 \gamma$ decay via the $\omega \pi$ and $f_0(500)\gamma$ mechanisms. NODE=M001R29;LINKAGE=A

[2] In the model assuming the $\rho \rightarrow \pi^0 \pi^0 \gamma$ decay via the $\omega \pi$ mechanism only. NODE=M001R29;LINKAGE=B

[3] Superseded by ACHASOV 02F. NODE=M001R;LINKAGE=GF

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

NODE=M001R10
NODE=M001R10

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.00045	90	DOLINSKY	89	ND	$e^+e^- \rightarrow \pi^0\pi^0\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.08	95	JACQUET	69B	HLBC	2.05 $\pi^+p \rightarrow \pi^+p\omega$

$\Gamma(\pi^0\pi^0\gamma)/\Gamma(\pi^0\gamma)$ — Γ_{13}/Γ_2

NODE=M001R7
NODE=M001R7

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
8.0±1.3 OUR FIT						
8.5±2.9		40 ± 14	ALDE	94B	GAM2	38$\pi^-p \rightarrow \pi^0\pi^0\gamma n$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
< 50	90		DOLINSKY	89	ND	$e^+e^- \rightarrow \pi^0\pi^0\gamma$
<1800	95		KEYNE	76	CNTR	$\pi^-p \rightarrow \omega n$
<1500	90		BENAKSAS	72C	OSPK	e^+e^-
<1400			BALDIN	71	HLBC	2.9 π^+p
<1000	90		BARMIN	64	HLBC	1.3–2.8 π^-p

$\Gamma(\pi^0\pi^0\gamma)/\Gamma(\text{neutrals})$ — $\Gamma_{13}/(\Gamma_2+\Gamma_4)$

NODE=M001R17
NODE=M001R17

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.22±0.07		[1] DAKIN	72	OSPK	1.4 $\pi^-p \rightarrow n$MM
<0.19	90	DEINET	69B	OSPK	

[1] See $\Gamma(\pi^0\gamma)/\Gamma(\text{neutrals})$.

NODE=M001R17;LINKAGE=D

$\Gamma(\eta\pi^0\gamma)/\Gamma_{\text{total}}$ — Γ_{14}/Γ

NODE=M001R32
NODE=M001R32

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
<3.3	90	AKHMETSHIN	04B	CMD2	0.6–0.97 $e^+e^- \rightarrow \eta\pi^0\gamma$

$\Gamma(\mu^+\mu^-)/\Gamma_{\text{total}}$ — Γ_{15}/Γ

NODE=M001R30
NODE=M001R30

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
7.4±1.8 OUR FIT					
7.4±1.8 OUR AVERAGE					
6.6±1.4±1.7	4.5M	[1] ANASTASI	17	KLOE	$e^+e^- \rightarrow \mu^+\mu^-\gamma$
9.0±2.9±1.1	18	HEISTER	02C	ALEP	$Z \rightarrow \mu^+\mu^- + X$

[1] Assuming lepton universality in the decay $\omega \rightarrow \ell^+\ell^-$ and correcting for different phase space between electron and muon final states.

NODE=M001R30;LINKAGE=A

$\Gamma(\mu^+\mu^-)/\Gamma(\pi^+\pi^-\pi^0)$ — Γ_{15}/Γ_1

NODE=M001R6
NODE=M001R6

VALUE (units 10^{-3})	CL%	DOCUMENT ID		TECN	COMMENT
<0.2	90	WILSON	69	OSPK	12 π^-C $\rightarrow$ Fe
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<1.7	74	FLATTE	66	HBC	1.2 – 1.7 $K^-p \rightarrow \Lambda\mu^+\mu^-$
<1.2		BARBARO-...	65	HBC	2.7 K^-p

$\Gamma(\pi^0\mu^+\mu^-)/\Gamma(\mu^+\mu^-)$ — Γ_7/Γ_{15}

NODE=M001R20
NODE=M001R20

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1.2±0.6	30	[1] DZHELYADIN	79	CNTR	25–33 π^-p

[1] Superseded by DZHELYADIN 81B result above.

NODE=M001R20;LINKAGE=S

$\Gamma(3\gamma)/\Gamma_{\text{total}}$ — Γ_{16}/Γ

NODE=M001R27
NODE=M001R27

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<1.9	95	[1] ABELE	97E	CBAR	0.0 $\bar{p}p \rightarrow 5\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<2	90	[1] PROKOSHKIN	95	GAM2	38 $\pi^-p \rightarrow 3\gamma n$

[1] From direct 3γ decay search.

NODE=M001R27;LINKAGE=A

$\Gamma(\eta\pi^0)/\Gamma_{\text{total}}$ — Γ_{17}/Γ

NODE=M001R25

Violates *C* conservation.

NODE=M001R25
NODE=M001R25

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.001	90	ALDE	94B	GAM2	38$\pi^-p \rightarrow \eta\pi^0 n$

$[\Gamma(\eta\gamma)+\Gamma(\eta\pi^0)]/\Gamma(\pi^+\pi^-\pi^0)$ — $(\Gamma_5+\Gamma_{17})/\Gamma_1$

NODE=M001R8
NODE=M001R8

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.016	90	[1] FLATTE	66	HBC	1.2 – 1.7 $K^- p \to \Lambda\pi^+\pi^-$ MM
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.045	95	JACQUET	69B	HLBC	2.05 $\pi^+ p \to \pi^+ p\omega$

[1] Restated by us using B($\eta \to$ charged modes) = 29.2%.

NODE=M001R8;LINKAGE=A

$\Gamma(\eta\pi^0)/\Gamma(\pi^0\gamma)$ — Γ_{17}/Γ_2

NODE=M001R35

Violates C conservation.

NODE=M001R35
NODE=M001R35

VALUE (units 10^{-3})	CL%	DOCUMENT ID		TECN	COMMENT
<2.6	90	[1] STAROSTIN	09	CRYM	$\gamma p \to \eta\pi^0 p$

[1] STAROSTIN 09 reports $[\Gamma(\omega(782) \to \eta\pi^0)/\Gamma(\omega(782) \to \pi^0\gamma)] \times [B(\eta \to 2\gamma)] < 1.01 \times 10^{-3}$ which we divide by our best value $B(\eta \to 2\gamma) = 39.36 \times 10^{-2}$.

NODE=M001R35;LINKAGE=ST

$\Gamma(2\pi^0)/\Gamma(\pi^0\gamma)$ — Γ_{18}/Γ_2

NODE=M001R36

Violates C conservation and Bose-Einstein statistics.

NODE=M001R36
NODE=M001R36

VALUE (units 10^{-3})	CL%	DOCUMENT ID		TECN	COMMENT
<2.59	90	STAROSTIN	09	CRYM	$\gamma p \to 2\pi^0 p$

$\Gamma(3\pi^0)/\Gamma_{total}$ — Γ_{19}/Γ

NODE=M001R26

Violates C conservation.

NODE=M001R26
NODE=M001R26

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<3 \times 10^{-4}$	90	PROKOSHKIN	95	GAM2	38 $\pi^- p \to 3\pi^0 n$

$\Gamma(3\pi^0)/\Gamma(\pi^0\gamma)$ — Γ_{19}/Γ_2

NODE=M001R37

Violates C conservation.

NODE=M001R37
NODE=M001R37

VALUE (units 10^{-3})	CL%	DOCUMENT ID		TECN	COMMENT
<2.72	90	STAROSTIN	09	CRYM	$\gamma p \to 3\pi^0 p$

$\Gamma(3\pi^0)/\Gamma(\pi^+\pi^-\pi^0)$ — Γ_{19}/Γ_1

NODE=M001R31

Violates C conservation.

NODE=M001R31
NODE=M001R31

VALUE	CL%	DOCUMENT ID		COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.009	90	BARBERIS	01	450 $pp \to p_f 3\pi^0 p_s$

$\Gamma(\text{invisible})/\Gamma(\pi^+\pi^-\pi^0)$ — Γ_{20}/Γ_1

NODE=M001R01
NODE=M001R01

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<8.1 \times 10^{-5}$	90	ABLIKIM	18S	BES3	$J/\psi \to \omega\eta \to \omega\pi^+\pi^-\pi^0$

PARAMETER Λ IN $\omega \to \pi^0\ell^+\ell^-$ DECAY

NODE=M001230

In the pole approximation the electromagnetic transition form factor for a resonance of mass M is given by the expression:

$$|F|^2 = (1 - M^2/\Lambda^2)^{-2},$$

where for the parameter Λ vector dominance predicts $\Lambda = M_\rho \approx 0.770$ GeV. The ARNALDI 09 measurement is in obvious conflict with this expectation. Note that for $\eta \to \gamma\mu^+\mu^-$ decay ARNALDI 09 and DZHELYADIN 80 obtain the value of Λ consistent with vector dominance.

NODE=M001230

PARAMETER Λ IN $\omega \to \pi^0\mu^+\mu^-$ DECAY

NODE=M001LAM
NODE=M001LAM

VALUE (GeV)	EVTS	DOCUMENT ID		TECN	COMMENT
0.670 ±0.006 OUR AVERAGE					
0.6707±0.0039±0.0056		[1] ARNALDI	16	NA60	400 GeV (p-A) collisions
0.668 ±0.009 ±0.003	3k	[2] ARNALDI	09	NA60	158A In−In collisions
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.65 ±0.03		DZHELYADIN	81B	CNTR	25–33 $\pi^- p \to \omega n$

[1] ARNALDI 16 reports $\Lambda^{-2}(\omega) = 2.223 \pm 0.026 \pm 0.037$ GeV^{-2} which we converted to the quoted Λ value.

NODE=M001LAM;LINKAGE=A

[2] ARNALDI 09 reports $\Lambda^{-2}(\omega) = 2.24 \pm 0.06 \pm 0.02$ GeV^{-2} which we converted to the quoted Λ value.

NODE=M001LAM;LINKAGE=B

PARAMETER Λ IN $\omega \to \pi^0 e^+ e^-$ DECAY

NODE=M001A02
NODE=M001A02

VALUE (GeV)	EVTS	DOCUMENT ID	TECN	COMMENT
0.709±0.037	1.1k	[1] ADLARSON 17B	A2MM	$\gamma p \to \omega p$

[1] ADLARSON 17B reports $\Lambda^{-2}(\omega\pi^0) = 1.99 \pm 0.21$ GeV^{-2} that we converted to the quoted Λ value.

NODE=M001A02;LINKAGE=A

ENERGY DEPENDENCE OF $\omega \to \pi^+\pi^-\pi^0$ DALITZ PLOT

NODE=M001A00
NODE=M001A00

The following experiments fit to one or more of the coefficients α, β, γ for $|$matrix element$|^2 \propto P\,(1 + 2\alpha\, Z + 2\beta\, Z^{3/2}\, \sin(3\phi) + 2\gamma Z^2 + O(Z^{5/2}))$ where P is the P-wave phase-space factor and Z, ϕ are kinematical variables as defined in ADLARSON 17.

NODE=M001A00

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.133 ±0.008 OUR AVERAGE				
0.1321±0.0067±0.0046	260k	[1] ABLIKIM 18AD	BES3	$J/\psi \to \omega\eta$
0.147 ±0.036	44k	ADLARSON 17	WASA	α in $pd \to {}^3$He ω, $pp \to pp\omega$

[1] Keeping a term linear in Z only. A fit with the terms proportional to Z and $Z^{3/2}$ gives $\alpha = 0.133 \pm 0.041$ and $\beta = 0.037 \pm 0.054$.

NODE=M001A00;LINKAGE=A

ω(782) REFERENCES

NODE=M001

IGNATOV 24 PR D109 112002 F.V. Ignatov *et al.* (CMD-3 Collab.) REFID=62672
PDG 22 PTEP 2022 083C01 R.L. Workman *et al.* (PDG Collab.) REFID=61634
ACHASOV 21 JHEP 2101 113 M.N. Achasov *et al.* (SND Collab.) REFID=61040
LEES 21B PR D104 112003 J.P. Lees *et al.* (BABAR Collab.) REFID=61450
ANDREEV 20 EPJ C80 1189 V. Andreev *et al.* (H1 Collab.) REFID=60773
HOID 20 EPJ C80 988 B.-L. Hoid, M. Hoferichter, B. Kubis (BONN, BERN) REFID=61048
COLANGELO 19 JHEP 1902 006 G. Colangelo, M. Hoferichter, P. Stoffer (BERN+) REFID=59585
HOFERICHT... 19 JHEP 1908 137 M. Hoferichter, B.-L. Hoid, B. Kubis (WASH, BONN) REFID=60974
ABLIKIM 18AD PR D98 112007 M. Ablikim *et al.* (BESIII Collab.) REFID=59498
ABLIKIM 18C PRL 120 242003 M. Ablikim *et al.* (BESIII Collab.) REFID=58843
ABLIKIM 18S PR D98 032001 M. Ablikim *et al.* (BESIII Collab.) REFID=58971
HANHART 18 EPJ C78 450 C. Hanhart *et al.* REFID=59186
ADLARSON 17 PL B770 418 P. Adlarson *et al.* (WASA-at-COSY Collab.) REFID=57907
ADLARSON 17B PR C95 035208 P. Adlarson *et al.* (A2 Collab. at MAMI) REFID=58155
ANASTASI 17 PL B767 485 A. Anastasi *et al.* (KLOE-2 Collab.) REFID=57887
ABLIKIM 16B PL B753 103 M. Ablikim *et al.* (BESIII Collab.) REFID=57126
ACHASOV 16A PR D93 092001 M.N. Achasov *et al.* (SND Collab.) REFID=57513
ARNALDI 16 PL B757 437 R. Arnaldi *et al.* (NA60 Collab.) REFID=57220
PDG 16 CP C40 100001 C. Patrignani *et al.* (PDG Collab.) REFID=57140
PDG 15 RPP 2015 at pdg.lbl.gov (PDG Collab.) REFID=56977;ERROR=1
ACHASOV 13 PR D88 054013 M.N. Achasov *et al.* (SND Collab.) REFID=55584
BABUSCI 13D PL B720 336 D. Babusci *et al.* (CATA, CALB, BARI) REFID=55337
BENAYOUN 13 EPJ C73 2453 M. Benayoun, P. David, L. DelBuono (PARIN, BERLIN+) REFID=55357
DAVIER 13 EPJ C73 2597 M. Davier *et al.* REFID=55499
LEES 12G PR D86 032013 J.P. Lees *et al.* (BABAR Collab.) REFID=54299
NIECKNIG 12 EPJ C72 2014 F. Niecknig, B. Kubis, S.P. Schneider (BONN) REFID=54305
AMBROSINO 11A PL B700 102 F. Ambrosino *et al.* (KLOE Collab.) REFID=16683
BENAYOUN 10 EPJ C65 211 M. Benayoun *et al.* REFID=53212
ACHASOV 09A JETP 109 379 M.N. Achasov *et al.* (SND Collab.) REFID=53101
Translated from ZETF 136 442.
ARNALDI 09 PL B677 260 R. Arnaldi *et al.* (NA60 Collab.) REFID=52720
AUBERT 09AS PRL 103 231801 B. Aubert *et al.* (BABAR Collab.) REFID=53136
STAROSTIN 09 PR C79 065201 A. Starostin *et al.* (Crystal Ball Collab. at MAMI) REFID=53001
ACHASOV 08 JETP 107 61 M.N. Achasov *et al.* (SND Collab.) REFID=52258
Translated from ZETF 134 80.
AMBROSINO 08G PL B669 223 F. Ambrosino *et al.* (KLOE Collab.) REFID=52573
ACHASOV 07B PR D76 077101 M.N. Achasov *et al.* (SND Collab.) REFID=51942
AKHMETSHIN 07 PL B648 28 R.R. Akhmetshin *et al.* (Novosibirsk CMD-2 Collab.) REFID=51615
ACHASOV 06 JETP 103 380 M.N. Achasov *et al.* (Novosibirsk SND Collab.) REFID=51113
Translated from ZETF 130 437.
ACHASOV 06A PR D74 014016 M.N. Achasov *et al.* (SND Collab.) REFID=51133
AULCHENKO 06 JETPL 84 413 V.M. Aulchenko *et al.* (Novosibirsk CMD-2 Collab.) REFID=51513
Translated from ZETFP 84 491.
ACHASOV 05A JETP 101 1053 M.N. Achasov *et al.* (Novosibirsk SND Collab.) REFID=51045
Translated from ZETF 128 1201.
AKHMETSHIN 05 PL B605 26 R.R. Akhmetshin *et al.* (Novosibirsk CMD-2 Collab.) REFID=50330
AKHMETSHIN 05A PL B613 29 R.R. Akhmetshin *et al.* (Novosibirsk CMD-2 Collab.) REFID=50508
AULCHENKO 05 JETPL 82 743 V.M. Aulchenko *et al.* (Novosibirsk CMD-2 Collab.) REFID=51060
Translated from ZETFP 82 841.
AKHMETSHIN 04 PL B578 285 R.R. Akhmetshin *et al.* (Novosibirsk CMD-2 Collab.) REFID=49609
AKHMETSHIN 04B PL B580 119 R.R. Akhmetshin *et al.* (Novosibirsk CMD-2 Collab.) REFID=49610
AUBERT,B 04N PR D70 072004 B. Aubert *et al.* (BABAR Collab.) REFID=50184
PDG 04 PL B592 1 S. Eidelman *et al.* (PDG Collab.) REFID=49653
ACHASOV 03 PL B559 171 M.N. Achasov *et al.* (Novosibirsk SND Collab.) REFID=49187
ACHASOV 03D PR D68 052006 M.N. Achasov *et al.* (Novosibirsk SND Collab.) REFID=49577
ALOISIO 03 PL B561 55 A. Aloisio *et al.* (KLOE Collab.) REFID=49404
BENAYOUN 03 EPJ C29 397 M. Benayoun *et al.* REFID=49477
ACHASOV 02E PR D66 032001 M.N. Achasov *et al.* (Novosibirsk SND Collab.) REFID=48815
ACHASOV 02F PL B537 201 M.N. Achasov *et al.* (Novosibirsk SND Collab.) REFID=48816
AKHMETSHIN 02 PL B527 161 R.R. Akhmetshin *et al.* (Novosibirsk CMD-2 Collab.) REFID=48565
ALOISIO 02D PL B537 21 A. Aloisio *et al.* (KLOE Collab.) REFID=48824
HEISTER 02C PL B528 19 A. Heister *et al.* (ALEPH Collab.) REFID=48564
ACHASOV 01E PR D63 072002 M.N. Achasov *et al.* (Novosibirsk SND Collab.) REFID=48311
AKHMETSHIN 01B PL B509 217 R.R. Akhmetshin *et al.* (Novosibirsk CMD-2 Collab.) REFID=48167
BARBERIS 01 PL B507 14 D. Barberis *et al.* REFID=48324
ACHASOV 00 EPJ C12 25 M.N. Achasov *et al.* (Novosibirsk SND Collab.) REFID=47417
ACHASOV 00D JETPL 72 282 M.N. Achasov *et al.* (Novosibirsk SND Collab.) REFID=47882
Translated from ZETFP 72 411.

ACHASOV	00G	JETPL 71 355	M.N. Achasov *et al.*	(Novosibirsk SND Collab.)	REFID=47929
		Translated from ZETFP 71 519.			
AKHMETSHIN	00C	PL B476 33	R.R. Akhmetshin *et al.*	(Novosibirsk CMD-2 Collab.)	REFID=47423
AULCHENKO	00A	JETP 90 927	V.M. Aulchenko *et al.*	(Novosibirsk SND Collab.)	REFID=47953
		Translated from ZETF 117 1067.			
CASE	00	PR D61 032002	T. Case *et al.*	(Crystal Barrel Collab.)	REFID=47409
ACHASOV	99E	PL B462 365	M.N. Achasov *et al.*	(Novosibirsk SND Collab.)	REFID=47391
GARDNER	99	PR D59 076002	S. Gardner, H.B. O'Connell		REFID=46919
BENAYOUN	98	EPJ C2 269	M. Benayoun *et al.*	(IPNP, NOVO, ADLD+)	REFID=45859
ABELE	97E	PL B411 361	A. Abele *et al.*	(Crystal Barrel Collab.)	REFID=45755
BENAYOUN	96	ZPHY C72 221	M. Benayoun *et al.*	(IPNP, NOVO)	REFID=45753
PROKOSHKIN	95	PD 40 273	Y.D. Prokoshkin, V.D. Samoilenko	(SERP)	REFID=44616
		Translated from DANS 342 610.			
WURZINGER	95	PR C51 443	R. Wurzinger *et al.*	(BONN, ORSAY, SACL+)	REFID=45209
ALDE	94B	PL B340 122	D.M. Alde *et al.*	(SERP, BELG, LANL, LAPP+)	REFID=44100
AMSLER	94C	PL B327 425	C. Amsler *et al.*	(Crystal Barrel Collab.)	REFID=44091
ALDE	93	PAN 56 1229	D.M. Alde *et al.*	(SERP, LAPP, LANL, BELG+)	REFID=43603
		Translated from YAF 56 137.			
Also		ZPHY C61 35	D.M. Alde *et al.*	(SERP, LAPP, LANL, BELG+)	REFID=43790
AMSLER	93B	PL B311 362	C. Amsler *et al.*	(Crystal Barrel Collab.)	REFID=43602
WEIDENAUER	93	ZPHY C59 387	P. Weidenauer *et al.*	(ASTERIX Collab.)	REFID=43585
ANTONELLI	92	ZPHY C56 15	A. Antonelli *et al.*	(DM2 Collab.)	REFID=43168
DOLINSKY	91	PRPL 202 99	S.I. Dolinsky *et al.*	(NOVO)	REFID=41369
WEIDENAUER	90	ZPHY C47 353	P. Weidenauer *et al.*	(ASTERIX Collab.)	REFID=41368
DOLINSKY	89	ZPHY C42 511	S.I. Dolinsky *et al.*	(NOVO)	REFID=41003
BITYUKOV	88B	SJNP 47 800	S.I. Bityukov *et al.*	(SERP)	REFID=41021
		Translated from YAF 47 1258.			
DOLINSKY	88	SJNP 48 277	S.I. Dolinsky *et al.*	(NOVO)	REFID=41022
		Translated from YAF 48 442.			
KURDADZE	88	JETPL 47 512	L.M. Kurdadze *et al.*	(NOVO)	REFID=41121
		Translated from ZETFP 47 432.			
AULCHENKO	87	PL B186 432	V.M. Aulchenko *et al.*	(NOVO)	REFID=40007
BARKOV	87	JETPL 46 164	L.M. Barkov *et al.*	(NOVO)	REFID=40280
		Translated from ZETFP 46 132.			
KURDADZE	86	JETPL 43 643	L.M. Kurdadze *et al.*	(NOVO)	REFID=40287
		Translated from ZETFP 43 497.			
BARKOV	85	NP B256 365	L.M. Barkov *et al.*	(NOVO)	REFID=20134
DRUZHININ	84	PL 144B 136	V.P. Druzhinin *et al.*	(NOVO)	REFID=20561
KURDADZE	83B	JETPL 36 274	A.M. Kurdadze *et al.*	(NOVO)	REFID=20244
		Translated from ZETFP 36 221.			
DZHELYADIN	81B	PL 102B 296	R.I. Dzhelyadin *et al.*	(SERP)	REFID=20242
CORDIER	80	NP B172 13	A. Cordier *et al.*	(LALO)	REFID=20240
DZHELYADIN	80	PL 94B 548	R.I. Dzhelyadin *et al.*	(SERP)	REFID=10831
ROOS	80	LNC 27 321	M. Roos, A. Pellinen	(HELS)	REFID=20241
BENKHEIRI	79	NP B150 268	P. Benkheiri *et al.*	(EPOL, CERN, CDEF+)	REFID=20238
DZHELYADIN	79	PL 84B 143	R.I. Dzhelyadin *et al.*	(SERP)	REFID=20239
COOPER	78B	NP B146 1	A.M. Cooper *et al.*	(TATA, CERN, CDEF+)	REFID=20235
QUENZER	78	PL 76B 512	A. Quenzer *et al.*	(LALO)	REFID=20123
VANAPEL...	78	NP B133 245	G.W. van Apeldoorn *et al.*	(ZEEM)	REFID=20234
WICKLUND	78	PR D17 1197	A.B. Wicklund *et al.*	(ANL)	REFID=20124
ANDREWS	77	PRL 38 198	D.E. Andrews *et al.*	(ROCH)	REFID=20120
GESSAROLI	77	NP B126 382	R. Gessaroli *et al.*	(BGNA, FIRZ, GENO+)	REFID=20230
KEYNE	76	PR D14 28	J. Keyne *et al.*	(LOIC, SHMP)	REFID=20226
Also		PR D8 2789	D.M. Binnie *et al.*	(LOIC, SHMP)	REFID=20216
KALBFLEISCH	75	PR D11 987	G.R. Kalbfleisch, R.C. Strand, J.W. Chapman	(BNL+)	REFID=20223
AGUILAR-...	72B	PR D6 29	M. Aguilar-Benitez *et al.*	(BNL)	REFID=20205
APEL	72B	PL 41B 234	W.D. Apel *et al.*	(KARLK, KARLE, PISA)	REFID=20206
BASILE	72B	Phil. Conf. 153	M. Basile *et al.*	(CERN)	REFID=20207
BENAKSAS	72	PL 39B 289	D. Benaksas *et al.*	(ORSAY)	REFID=20096
BENAKSAS	72B	PL 42B 507	D. Benaksas *et al.*	(ORSAY)	REFID=20209
BENAKSAS	72C	PL 42B 511	D. Benaksas *et al.*	(ORSAY)	REFID=20517
BORENSTEIN	72	PR D5 1559	S.R. Borenstein *et al.*	(BNL, MICH)	REFID=20215
BROWN	72	PL 42B 117	R.M. Brown *et al.*	(ILL, ILLC)	REFID=20211
DAKIN	72	PR D6 2321	J.T. Dakin *et al.*	(PRIN)	REFID=20212
RATCLIFF	72	PL 38B 345	B.N. Ratcliff *et al.*	(SLAC)	REFID=20102
ALVENSLEB...	71C	PRL 27 888	H. Alvensleben *et al.*	(DESY)	REFID=20193
BALDIN	71	SJNP 13 758	A.B. Baldin *et al.*	(ITEP)	REFID=20195
		Translated from YAF 13 1318.			
BEHREND	71	PRL 27 61	H.J. Behrend *et al.*	(ROCH, CORN, FNAL)	REFID=20197
BIZZARRI	71	NP B27 140	R. Bizzarri *et al.*	(CERN, CDEF)	REFID=20198
COYNE	71	NP B32 333	D.G. Coyne *et al.*	(LRL)	REFID=20201
MOFFEIT	71	NP B29 349	K.C. Moffeit *et al.*	(LRL, UCB, SLAC+)	REFID=20204
ABRAMOVI...	70	NP B20 209	M. Abramovich *et al.*	(CERN)	REFID=20180
BIGGS	70B	PRL 24 1201	P.J. Biggs *et al.*	(DARE)	REFID=20184
BIZZARRI	70	PRL 25 1385	R. Bizzarri *et al.*	(ROMA, SYRA)	REFID=20181
ROOS	70	DNPL/R7 173	M. Roos	(CERN)	REFID=20191
Proc. Daresbury Study Weekend No. 1.					
AUGUSTIN	69D	PL 28B 513	J.E. Augustin *et al.*	(ORSAY)	REFID=20169
BIZZARRI	69	NP B14 169	R. Bizzarri *et al.*	(CERN, CDEF)	REFID=20171
DEINET	69B	PL 30B 426	W. Deinet *et al.*	(KARL, CERN)	REFID=20173
JACQUET	69B	NC 63A 743	F. Jacquet *et al.*	(EPOL, BERG)	REFID=20176
WILSON	69	Private Comm.	R. Wilson	(HARV)	REFID=20179
Also		PR 178 2095	A.A. Wehmann *et al.*	(HARV, CASE, SLAC+)	REFID=20084
ASTVACAT...	68	PL 27B 45	R.G. Astvatsaturov *et al.*	(JINR, MOSU)	REFID=20055
BOLLINI	68C	NC 56A 531	D. Bollini *et al.*	(CERN, BGNA, STRB)	REFID=20164
GOUNARIS	68	PRL 21 244	G.J. Gounaris, J.J. Sakurai		REFID=48054
BARASH	67B	PR 156 1399	N. Barash *et al.*	(COLU)	REFID=20160
FELDMAN	67C	PR 159 1219	M. Feldman *et al.*	(PENN)	REFID=20161
DIGIUGNO	66B	NC 44A 1272	G. Di Giugno *et al.*	(NAPL, FRAS, TRST)	REFID=20156
FLATTE	66	PR 145 1050	S.M. Flatte *et al.*	(LRL)	REFID=20157
JAMES	66	PR 142 896	F.E. James, H.L. Kraybill	(YALE, BNL)	REFID=10770
BARBARO-...	65	PRL 14 279	A. Barbaro-Galtieri, R.D. Tripp	(LRL)	REFID=20152
BARMIN	64	JETP 18 1289	V.V. Barmin *et al.*	(ITEP)	REFID=20149
		Translated from ZETF 45 1879.			
KRAEMER	64	PR 136 B496	R.W. Kraemer *et al.*	(JHU, NWES, WOOD)	REFID=10755
BUSCHBECK	63	Siena Conf. 1 166	B. Buschbeck *et al.*	(VIEN, CERN, ANIK)	REFID=20146