[10] Enters fit through W/Z mass ratio below. The ALITTI 92B systematic error (±0.93) has two contributions: one (±0.92) cancels in m_W/m_Z and one (±0.12) is noncancelling. These were added in quadrature.
[11] BANERJEE 92 is a combined analysis of the four LEP experiments as of March 1991.
[12] The systematic error (0.02) is an error in common to the 4 LEP experiments.
[13] LEP 92 is combined analysis by the four LEP experiments as of December 1991. Systematic errors are included.
[14] Enters fit through Z-W mass difference below.
[15] ALBAJAR 89 result is from a total sample of 33 $Z \to e^+e^-$ events.

Z WIDTH

VALUE (GeV)	EVTS	DOCUMENT ID		TECN	COMMENT
2.490±0.007 OUR FIT					
2.491±0.007 OUR AVERAGE					
2.483±0.011±0.0045	1.15M	[16] ABREU	94	DLPH	$E^{ee}_{\rm cm}$= 88–94 GeV
2.494±0.009±0.0045	1.2M	[16] ACCIARRI	94	L3	$E^{ee}_{\rm cm}$= 88–94 GeV
2.483±0.011±0.0045	1.33M	[16] AKERS	94	OPAL	$E^{ee}_{\rm cm}$= 88–94 GeV
2.501±0.011±0.0045	1.28M	[16] BUSKULIC	94	ALEP	$E^{ee}_{\rm cm}$= 88–94 GeV
3.8 ±0.8 ±1.0	188	ABE	89C	CDF	$E^{p\overline{p}}_{\rm cm}$= 1800 GeV
$2.42\ ^{+0.45}_{-0.35}$	480	[17] ABRAMS	89B	MRK2	$E^{ee}_{\rm cm}$= 89–93 GeV
$2.7\ ^{+1.2}_{-1.0}\ \pm1.3$	24	[18] ALBAJAR	89	UA1	$E^{p\overline{p}}_{\rm cm}$= 546,630 GeV
2.7 ±2.0 ±1.0	25	[19] ANSARI	87	UA2	$E^{p\overline{p}}_{\rm cm}$= 546,630 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
2.483±0.011±0.004	512k	[20] ACTON	93D	OPAL	Repl. by AKERS 94
2.490±0.011	460k	[21] ADRIANI	93F	L3	Repl. by ACCIARRI 94
2.492±0.012	463k	[22] ADRIANI	93H	L3	$E^{ee}_{\rm cm}$= 88–94 GeV
2.501±0.012	520k	[23] BUSKULIC	93J	ALEP	Repl. by BUSKULIC 94
2.490±0.007	1.9M	[24] QUAST	93	RVUE	$E^{ee}_{\rm cm}$= 88–94 GeV
2.481±0.010	550k	[25] BANERJEE	92	RVUE	$E^{ee}_{\rm cm}$= 88–94 GeV
2.484±0.017±0.005	190k	[26] DECAMP	92B	ALEP	Repl. by BUSKULIC 93J
2.487±0.010	650k	[27] LEP	92	RVUE	$E^{ee}_{\rm cm}$= 88–94 GeV
2.465±0.019±0.005	150k	[26] ABREU	91F	DLPH	Repl. by ABREU 94
2.501±0.017±0.005	125k	[26] ADEVA	91E	L3	Repl. by ADRIANI 93F
2.492±0.015±0.005	184k	[26] ALEXANDER	91F	OPAL	Repl. by ACTON 93D

[16] The second error of 4.5 MeV is due to a common LEP energy uncertainty.
[17] ABRAMS 89B uncertainty includes 50 MeV due to the miniSAM background subtraction error.
[18] ALBAJAR 89 result is from a total sample of 33 $Z \to e^+e^-$ events.
[19] Quoted values of ANSARI 87 are from direct fit. Ratio of Z and W production gives either $\Gamma(Z) < (1.09\pm0.07)\times\Gamma(W)$, CL = 90% or $\Gamma(Z) = (0.82^{+0.19}_{-0.14}\pm0.06)\times\Gamma(W)$. Assuming Standard-Model value $\Gamma(W)$ = 2.65 GeV then gives $\Gamma(Z) <$ 2.89 ± 0.19 or $= 2.17^{+0.50}_{-0.37} \pm 0.16$.
[20] The systematic error is from the uncertainty in the LEP energy calibration.
[21] The error in ADRIANI 93F includes 4 MeV due to the uncertainty in LEP energy calibration.
[22] ADRIANI 93H use the S-matrix approach to determine the pole position for the Z boson.
[23] The error in BUSKULIC 93J includes 4 MeV due to the uncertainty in LEP energy calibration.
[24] QUAST 93 is a combined analysis of LEP results as of Feb. 1993. A common systematic error of 4 MeV is taken into account.
[25] BANERJEE 92 is a combined analysis of the four LEP experiments as of March 1991.
[26] The systematic error (0.005) is an error in common to the 4 LEP experiments.
[27] LEP 92 is combined analysis by the four LEP experiments as of December 1991. Systematic errors are included.

Z DECAY MODES

	Mode		Fraction (Γ_i/Γ)	Confidence level
Γ_1	e^+e^-		(3.366±0.008) %	
Γ_2	$\mu^+\mu^-$		(3.367±0.013) %	
Γ_3	$\tau^+\tau^-$		(3.360±0.015) %	
Γ_4	$\ell^+\ell^-$	[a]	(3.367±0.006) %	
Γ_5	invisible		(20.01 ±0.16) %	
Γ_6	hadrons		(69.90 ±0.15) %	
Γ_7	$(u\overline{u}+c\overline{c})/2$		(9.7 ±1.8) %	
Γ_8	$(d\overline{d}+s\overline{s}+b\overline{b})/3$		(16.8 ±1.2) %	
Γ_9	$c\overline{c}$		(11.9 ±1.4) %	
Γ_{10}	$b\overline{b}$		(15.45 ±0.21) %	
Γ_{11}	$\pi^0\gamma$		$<$ 5.5 $\times 10^{-5}$	95%
Γ_{12}	$\eta\gamma$		$<$ 5.1 $\times 10^{-5}$	95%
Γ_{13}	$\omega\gamma$		$<$ 6.5 $\times 10^{-4}$	95%
Γ_{14}	$\eta'(958)\gamma$		$<$ 4.2 $\times 10^{-5}$	95%
Γ_{15}	$\gamma\gamma$		$<$ 5.5 $\times 10^{-5}$	95%
Γ_{16}	$\gamma\gamma\gamma$		$<$ 1.7 $\times 10^{-5}$	95%
Γ_{17}	$\pi^\pm W^\mp$	[b]	$<$ 7 $\times 10^{-5}$	95%
Γ_{18}	$\rho^\pm W^\mp$	[b]	$<$ 8.3 $\times 10^{-5}$	95%
Γ_{19}	K^0X		(61.5 ±0.6) %	
Γ_{20}	$K^*(892)^+$X		(51 ±5) %	
Γ_{21}	ΛX		(20.9 ±0.6) %	
Γ_{22}	Ξ^-X		(1.42 ±0.14) %	
Γ_{23}	$\Sigma(1385)^\pm$X		(2.6 ±0.4) %	
Γ_{24}	$\Xi(1530)^0$X		(4.4 ±1.0) $\times 10^{-3}$	
Γ_{25}	Ω^-X		(3.5 ±1.0) $\times 10^{-3}$	
Γ_{26}	$J/\psi(1S)$X		(3.8 ±0.5) $\times 10^{-3}$	
Γ_{27}	$\chi_{c1}(1P)$X		(7.5 ±3.0) $\times 10^{-3}$	
Γ_{28}	$(D^0/\overline{D}^0)$ X		(28 ±4) %	
Γ_{29}	$D^\pm$X		(13.9 ±2.1) %	
Γ_{30}	$D^*(2010)^\pm$X	[b]	(12.5 ±1.3) %	
Γ_{31}	B^0_sX		seen	
Γ_{32}	anomalous $\gamma+$ hadrons	[c]	$<$ 3.2 $\times 10^{-3}$	95%
Γ_{33}	$e^+e^-\gamma$	[c]	$<$ 5.2 $\times 10^{-4}$	95%
Γ_{34}	$\mu^+\mu^-\gamma$	[c]	$<$ 5.6 $\times 10^{-4}$	95%
Γ_{35}	$\tau^+\tau^-\gamma$	[c]	$<$ 7.3 $\times 10^{-4}$	95%
Γ_{36}	$\ell^+\ell^-\gamma\gamma$	[d]	$<$ 6.8 $\times 10^{-6}$	95%
Γ_{37}	$q\overline{q}\gamma\gamma$	[d]	$<$ 5.5 $\times 10^{-6}$	95%
Γ_{38}	$\nu\overline{\nu}\gamma\gamma$	[d]	$<$ 3.1 $\times 10^{-6}$	95%
Γ_{39}	$e^\pm\mu^\mp$ LF	[b]	$<$ 6 $\times 10^{-6}$	95%
Γ_{40}	$e^\pm\tau^\mp$ LF	[b]	$<$ 1.3 $\times 10^{-5}$	95%
Γ_{41}	$\mu^\pm\tau^\mp$ LF	[b]	$<$ 1.9 $\times 10^{-5}$	95%

[a] ℓ indicates each type of lepton (e, μ, and τ), not sum over them.

[b] The value is for the sum of the charge states indicated.

[c] See the Full Listings below for the γ energy range used in this measurement.

[d] For $m_{\gamma\gamma}$ = (60 ± 5) GeV.

Z PARTIAL WIDTHS

$\Gamma(e^+e^-)$ Γ_1

This parameter is not directly used in the overall fit but is derived using the fit results; see the 'Note on the Z Boson.'

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
83.83±0.30 OUR FIT					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
83.31±0.54	31.4k	ABREU	94	DLPH	$E^{ee}_{\rm cm}$= 88–94 GeV
83.43±0.52	38k	ACCIARRI	94	L3	$E^{ee}_{\rm cm}$= 88–94 GeV
83.63±0.53	42k	AKERS	94	OPAL	$E^{ee}_{\rm cm}$= 88–94 GeV
84.61±0.49	45.8k	BUSKULIC	94	ALEP	$E^{ee}_{\rm cm}$= 88–94 GeV
83.03±0.66	17k	ACTON	93D	OPAL	Repl. by AKERS 94
83.0 ±0.6	16k	ADRIANI	93M	L3	Repl. by ACCIARRI 94
84.43±0.60		BUSKULIC	93J	ALEP	Repl. by BUSKULIC 94
83.30±0.35	70k	[28] QUAST	93	RVUE	$E^{ee}_{\rm cm}$ = 88–94 GeV
82.6 ±0.7	16k	[29] BANERJEE	92	RVUE	$E^{ee}_{\rm cm}$= 88–94 GeV
83.8 ±0.9	6947	DECAMP	92B	ALEP	Repl. by BUSKULIC 93J
83.20±0.55	19k	[30] LEP	92	RVUE	$E^{ee}_{\rm cm}$= 88–94 GeV
82.4 ±1.1 ±0.5	2772	ABREU	91F	DLPH	Repl. by ABREU 94
83.3 ±1.1	4175	ADEVA	91E	L3	Repl. by ADRIANI 93M
82.9 ±1.0	5507	ALEXANDER	91F	OPAL	Repl. by ACTON 93D

[28] QUAST 93 is a combined analysis of LEP results as of Feb. 1993.
[29] BANERJEE 92 is a combined analysis of the four LEP experiments as of March 1991.
[30] LEP 92 is combined analysis by the four LEP experiments as of December 1991. Systematic errors are included.

$\Gamma(\mu^+\mu^-)$ Γ_2

This parameter is not directly used in the overall fit but is derived using the fit results; see the 'Note on the Z Boson.'

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
83.84±0.39 OUR FIT					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
84.15±0.77	45.6k	ABREU	94	DLPH	$E^{ee}_{\rm cm}$= 88–94 GeV
83.20±0.79	34k	ACCIARRI	94	L3	$E^{ee}_{\rm cm}$= 88–94 GeV
83.83±0.65	57k	AKERS	94	OPAL	$E^{ee}_{\rm cm}$= 88–94 GeV
83.62±0.75	46.4k	BUSKULIC	94	ALEP	$E^{ee}_{\rm cm}$= 88–94 GeV
84.43±0.92	23k	ACTON	93D	OPAL	Repl. by AKERS 94
82.8 ±1.0	14k	ADRIANI	93M	L3	Repl. by ACCIARRI 94
83.66±0.95		BUSKULIC	93J	ALEP	Repl. by BUSKULIC 94
83.82±0.52	70k	[31] QUAST	93	RVUE	$E^{ee}_{\rm cm}$ = 88–94 GeV
83.7 ±1.1	16k	[32] BANERJEE	92	RVUE	$E^{ee}_{\rm cm}$= 88–94 GeV
81.4 ±1.4	6691	DECAMP	92B	ALEP	Repl. by BUSKULIC 93J
83.35±0.86	21k	[33] LEP	92	RVUE	$E^{ee}_{\rm cm}$= 88–94 GeV
86.9 ±1.9 ±0.9	3428	ABREU	91F	DLPH	Repl. by ABREU 94
84.5 ±2.0	3245	ADEVA	91E	L3	Repl. by ADRIANI 93M
83.2 ±1.5	7240	ALEXANDER	91F	OPAL	Repl. by ACTON 93D

[31] QUAST 93 is a combined analysis of LEP results as of Feb. 1993.
[32] BANERJEE 92 is a combined analysis of the four LEP experiments as of March 1991.
[33] LEP 92 is combined analysis by the four LEP experiments as of December 1991. Systematic errors are included.