g_V^τ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
−0.0389±0.0043 OUR FIT					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
−0.0384±0.0078	25k	[144] ACCIARRI	94	L3	$E_{\rm cm}^{ee}$= 88–94 GeV
−0.038 ±0.005	45.1k	[145] BUSKULIC	94	ALEP	$E_{\rm cm}^{ee}$= 88–94 GeV
−0.037 ±0.008	7441	[146] ADRIANI	93M	L3	Repl. by ACCIARRI 94
−0.039 ±0.006		[144] BUSKULIC	93J	ALEP	Repl. by BUSKULIC 94
−0.039 ±0.004	50k	[147] QUAST	93	RVUE	$E_{\rm cm}^{ee}$= 88–94 GeV
$-0.287\,^{+0.127}_{-0.077}$	16k	[148] BANERJEE	92	RVUE	$E_{\rm cm}^{ee}$= 88–94 GeV
$-0.045\,^{+0.010}_{-0.011}$	6260	[149] DECAMP	92B	ALEP	Repl. by BUSKULIC 93J
$-0.104\,^{+0.040}_{-0.066}$	6260	[150] DECAMP	92B	ALEP	Repl. by BUSKULIC 93J

[144] The τ polarization result has been included.
[145] BUSKULIC 94 use the added constraint of τ polarization.
[146] ADRIANI 93M use their measurement of the τ polarization in addition to forward-backward lepton asymmetries.
[147] QUAST 93 is a combined analysis of LEP results as of Feb. 1993. QUAST 93 use also the average LEP values for τ polarization and the forward–backward τ polarisation asymmetry.
[148] BANERJEE 92 is a combined analysis of the four LEP experiments as of March 1991. Only forward-backward lepton asymmetries are used.
[149] DECAMP 92B use their measurement of the τ polarization in addition to the forward-backward lepton asymmetries.
[150] Using only forward-backward lepton asymmetries.

g_V^ℓ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
−0.0377±0.0016 OUR FIT					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
−0.039 ±0.004	50.3k	[151] ABREU	94	DLPH	$E_{\rm cm}^{ee}$= 88–94 GeV
$-0.0378\,^{+0.0045}_{-0.0042}$	97k	[152] ACCIARRI	94	L3	$E_{\rm cm}^{ee}$= 88–94 GeV
−0.034 ±0.004	146k	[151] AKERS	94	OPAL	$E_{\rm cm}^{ee}$= 88–94 GeV
−0.038 ±0.004	137.3k	[151] BUSKULIC	94	ALEP	$E_{\rm cm}^{ee}$= 88–94 GeV
−0.027 ±0.008	58k	[151] ACTON	93D	OPAL	Repl. by AKERS 94
$-0.040\,^{+0.006}_{-0.005}$		[152] ADRIANI	93M	L3	Repl. by ACCIARRI 94
$-0.034\,^{+0.004}_{-0.003}$		[152] BUSKULIC	93J	ALEP	Repl. by BUSKULIC 94
−0.0355±0.0025	190k	[153] QUAST	93	RVUE	$E_{\rm cm}^{ee}$= 88–94 GeV
$-0.034\,^{+0.009}_{-0.007}$	50k	[154] BANERJEE	92	RVUE	$E_{\rm cm}^{ee}$= 88–94 GeV
$-0.041\,^{+0.007}_{-0.006}$	20k	[152] DECAMP	92B	ALEP	Repl. by BUSKULIC 93J
$-0.042\,^{+0.009}_{-0.007}$	20k	[151] DECAMP	92B	ALEP	Repl. by BUSKULIC 93J
−0.034 ±0.006	57k	[155] LEP	92	RVUE	$E_{\rm cm}^{ee}$= 88–94 GeV
−0.017 ±0.029	9k	[151] ABREU	91F	DLPH	Repl. by ABREU 94
$-0.046\,^{+0.015}_{-0.012}$	10k	[151] ADEVA	91E	L3	Repl. by ADRIANI 93M
−0.024 ±0.015	18k	[151] ALEXANDER	91F	OPAL	Repl. by AKERS 94

[151] Using forward-backward lepton asymmetries.
[152] The τ polarization result has been included.
[153] QUAST 93 is a combined analysis of LEP results as of Feb. 1993. QUAST 93 use also the average LEP values for τ polarization and the forward–backward τ polarisation asymmetry. Assumes lepton universality.
[154] BANERJEE 92 is a combined analysis of the four LEP experiments as of March 1991. Forward-backward lepton asymmetries are used.
[155] LEP 92 is a combined analysis of the four LEP experiments as of December 1991. Forward-backward lepton asymmetries are used.

Z AXIAL-VECTOR COUPLINGS

These quantities are the effective axial-vector couplings of the Z to charged leptons. Their magnitude is derived from a measurement of the Z line-shape and the forward-backward lepton asymmetries as a function of energy around the Z mass. The relative sign among the vector to axial-vector couplings is obtained from a measurement of the Z asymmetry parameters, A_e and A_τ, or ν_e scattering. The fit values quoted below correspond to global nine- or five-parameter fits to lineshape, lepton forward-backward asymmetry, and A_e and A_τ measurements. See "Note on the Z boson" for details.

g_A^e

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
−0.5007±0.0009 OUR FIT					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
−0.4998±0.0016	38k	[156] ACCIARRI	94	L3	$E_{\rm cm}^{ee}$= 88–94 GeV
−0.503 ±0.002	45.8k	[156] BUSKULIC	94	ALEP	$E_{\rm cm}^{ee}$= 88–94 GeV
−0.4980±0.0021		[156] ADRIANI	93M	L3	Repl. by ACCIARRI 94
−0.5029±0.0018		[156] BUSKULIC	93J	ALEP	Repl. by BUSKULIC 94

[156] The τ-polarization constraint has been included.

g_A^μ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
−0.5015±0.0009 OUR FIT					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$-0.4987\,^{+0.0030}_{-0.0026}$	34k	[157] ACCIARRI	94	L3	$E_{\rm cm}^{ee}$= 88–94 GeV
−0.501 ±0.002	46.4k	[157] BUSKULIC	94	ALEP	$E_{\rm cm}^{ee}$= 88–94 GeV
$-0.4968\,^{+0.0050}_{-0.0037}$		[157] ADRIANI	93M	L3	Repl. by ACCIARRI 94
−0.5014±0.0029		[157] BUSKULIC	93J	ALEP	Repl. by BUSKULIC 94

[157] The τ-polarization constraint has been included.

g_A^τ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
−0.5005±0.0010 OUR FIT					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
−0.5014±0.0029	25k	[158] ACCIARRI	94	L3	$E_{\rm cm}^{ee}$= 88–94 GeV
−0.502 ±0.003	45.1k	[158] BUSKULIC	94	ALEP	$E_{\rm cm}^{ee}$= 88–94 GeV
−0.5032±0.0038	7441	[158] ADRIANI	93M	L3	Repl. by ACCIARRI 94
−0.5016±0.0033		[158] BUSKULIC	93J	ALEP	Repl. by BUSKULIC 94

[158] The τ-polarization constraint has been included.

g_A^ℓ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
−0.5008±0.0008 OUR FIT					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
−0.4999±0.0014	71k	ABREU	94	DLPH	$E_{\rm cm}^{ee}$= 88–94 GeV
−0.4998±0.0014	97k	[159] ACCIARRI	94	L3	$E_{\rm cm}^{ee}$= 88–94 GeV
−0.500 ±0.001	146k	AKERS	94	OPAL	$E_{\rm cm}^{ee}$= 88–94 GeV
−0.502 ±0.001	137k	[159] BUSKULIC	94	ALEP	$E_{\rm cm}^{ee}$= 88–94 GeV
−0.4998±0.0016	58k	ACTON	93D	OPAL	Repl. by AKERS 94
−0.4986±0.0015		[159] ADRIANI	93M	L3	Repl. by ACCIARRI 94
−0.5022±0.0015		[159] BUSKULIC	93J	ALEP	Repl. by BUSKULIC 94
−0.499 ±0.001	57k	[160] LEP	92	RVUE	$E_{\rm cm}^{ee}$= 88–94 GeV
−0.501 ±0.003	9k	ABREU	91F	DLPH	Repl. by ABREU 94

[159] The τ-polarization constraint has been included.
[160] LEP 92 is a combined analysis of the four LEP experiments as of December 1991.

Z ASYMMETRY PARAMETERS

For each fermion-antifermion pair coupling to the Z these quantities are defined as

$$A_f = \frac{2g_V^f g_A^f}{(g_V^f)^2 + (g_A^f)^2}$$

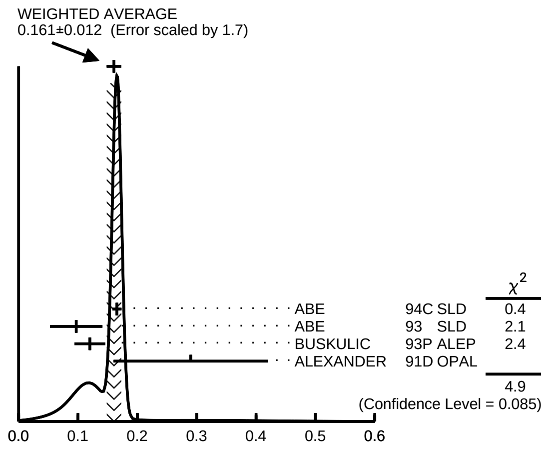
where g_V^f and g_A^f are the effective vector and axial-vector couplings. For their relation to the various lepton asymmetries see the 'Note on the Z Boson.'

A_e

Using polarized beams, this quantity can also be measured as $(\sigma_L - \sigma_R)/(\sigma_L + \sigma_R)$, where σ_L and σ_R are the e^+e^- production cross sections for Z bosons produced with left-handed and right-handed electrons respectively.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.161 ±0.012 OUR AVERAGE		Error includes scale factor of 1.7. See the ideogram below.			
0.1656±0.0071±0.0028	49392	[161] ABE	94C	SLD	$E_{\rm cm}^{ee}$= 91.26 GeV
0.097 ±0.044 ±0.004	10224	[162] ABE	93	SLD	$E_{\rm cm}^{ee}$= 91.26 GeV
0.120 ±0.026		[163] BUSKULIC	93P	ALEP	$E_{\rm cm}^{ee}$= 88–94 GeV
0.29 ±0.13	3245	[163] ALEXANDER	91D	OPAL	$E_{\rm cm}^{ee}$= 88–94 GeV

[161] ABE 94C measured the left-right asymmetry in Z production. This value leads to $\sin^2\theta_W = 0.2292 \pm 0.0009 \pm 0.0004$.
[162] ABE 93 measured the left-right asymmetry in Z production.
[163] Derived from the measurement of forward-backward τ polarization asymmetry.



A_e