TGC Measurement in $e^+e^- \to W^+W^- \to 4q$ using total σ and angular distributions

Status Report

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upon request by GOLOB

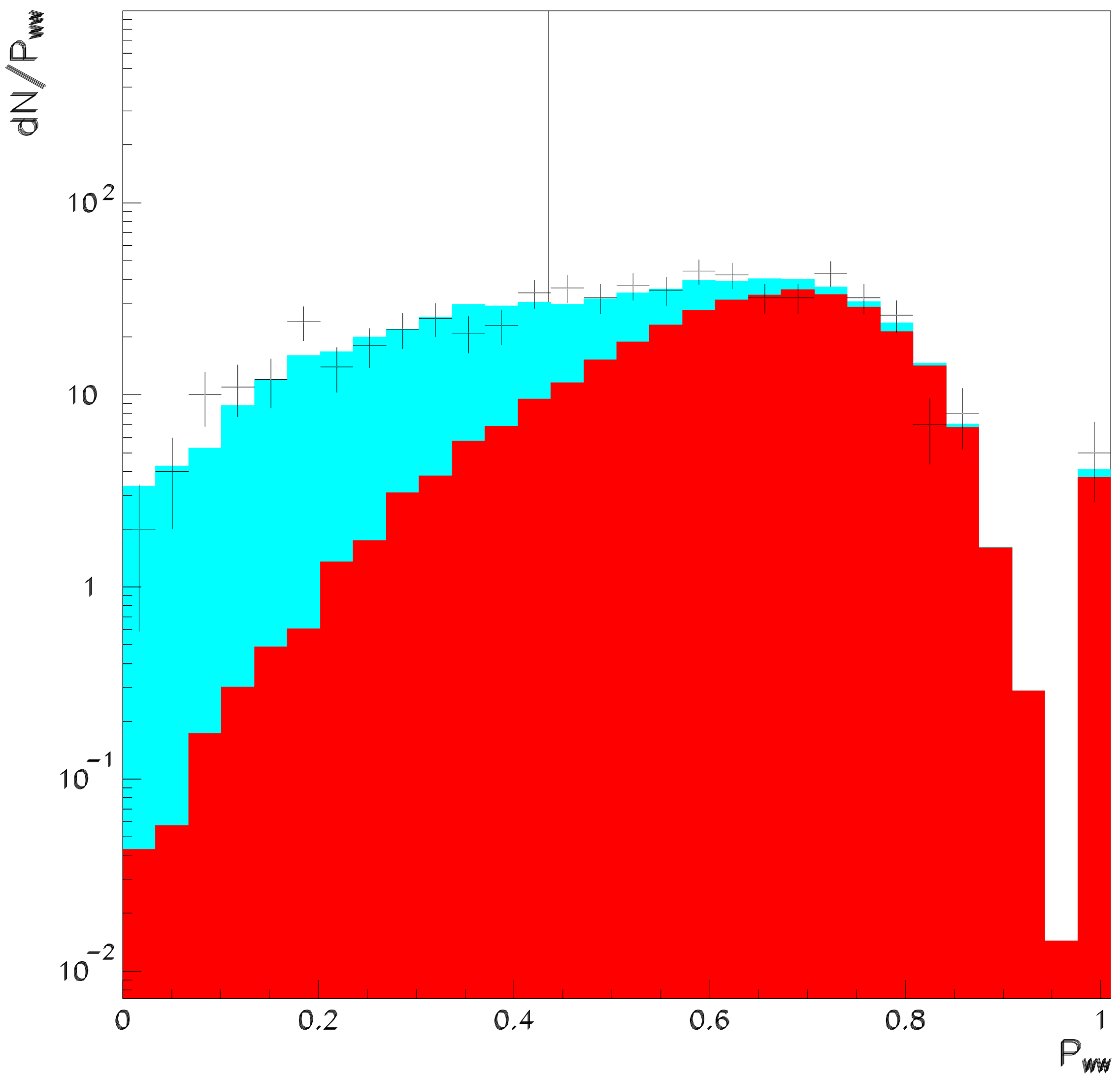
Status

Status:

- Results for 183 data
- Equiprobable binning used
- Expected errors

Event Selection

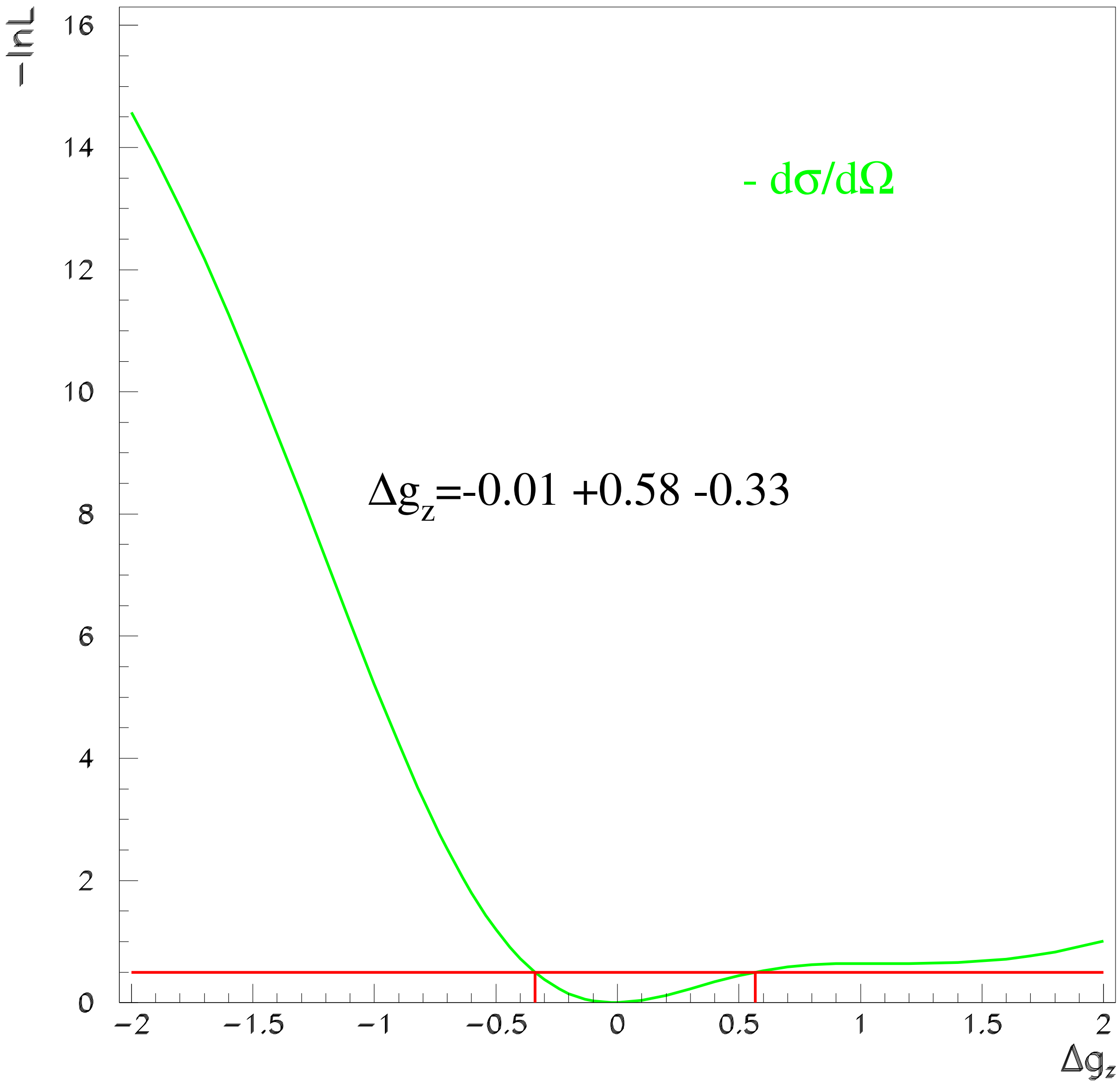
Distribution of events according to P_{WW} separator.



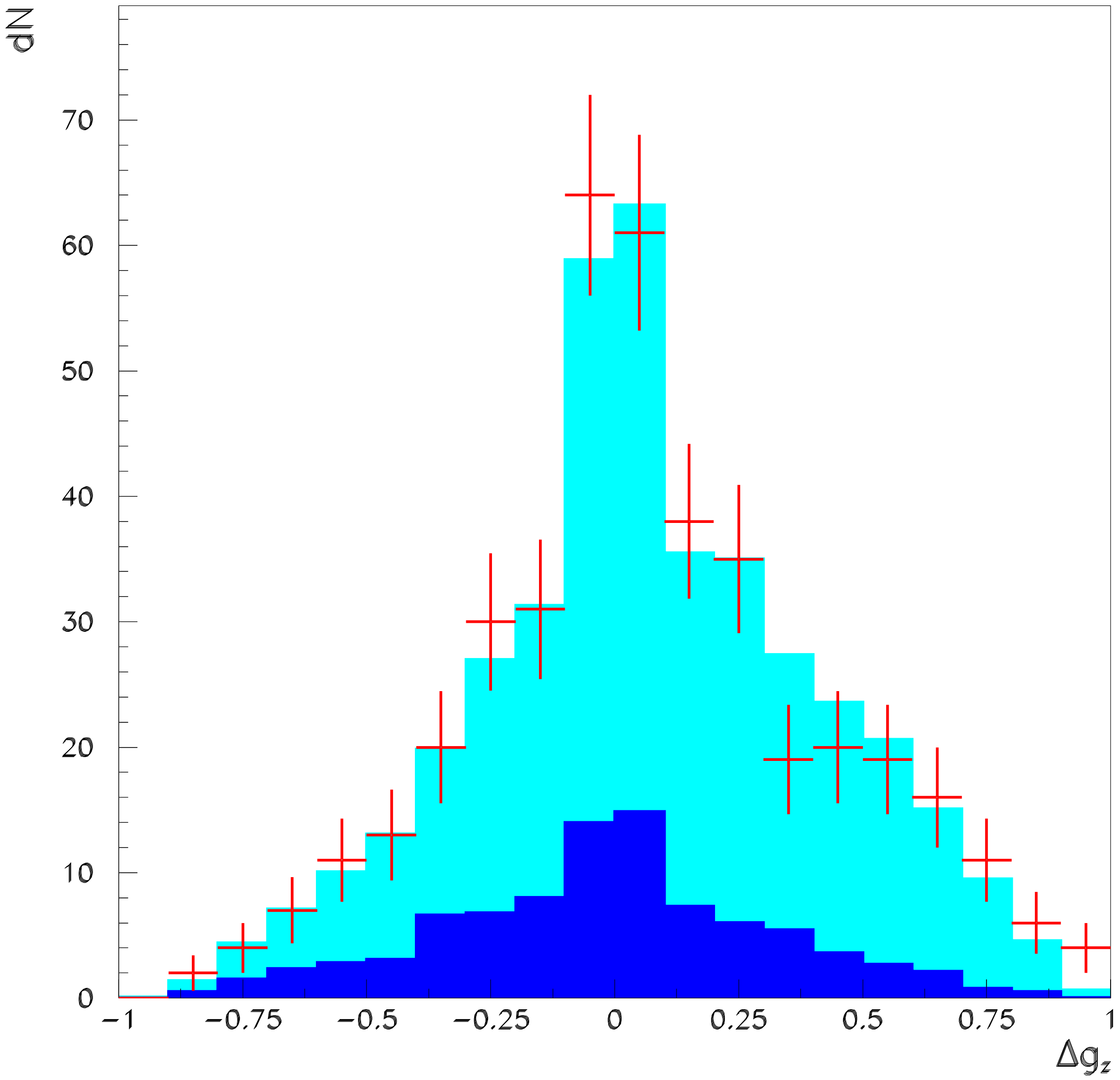
We cut at $P_{WW} = 0.433$ (arrow):

- η ~83%,
- Pur ~75%
- 411 measured events survive the cut.

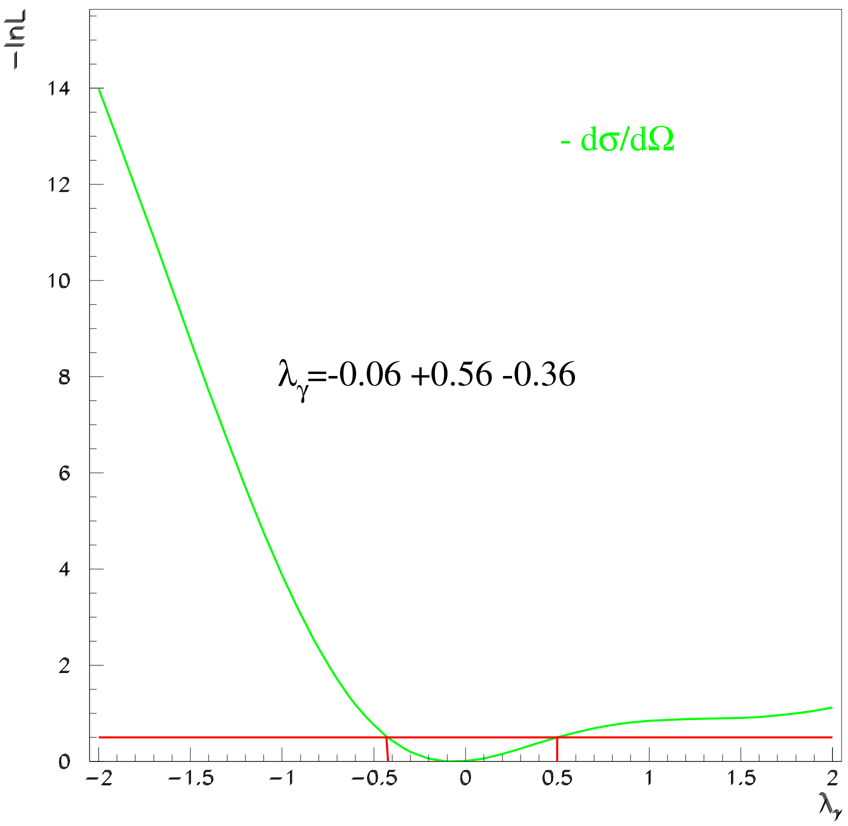
Angular distributions

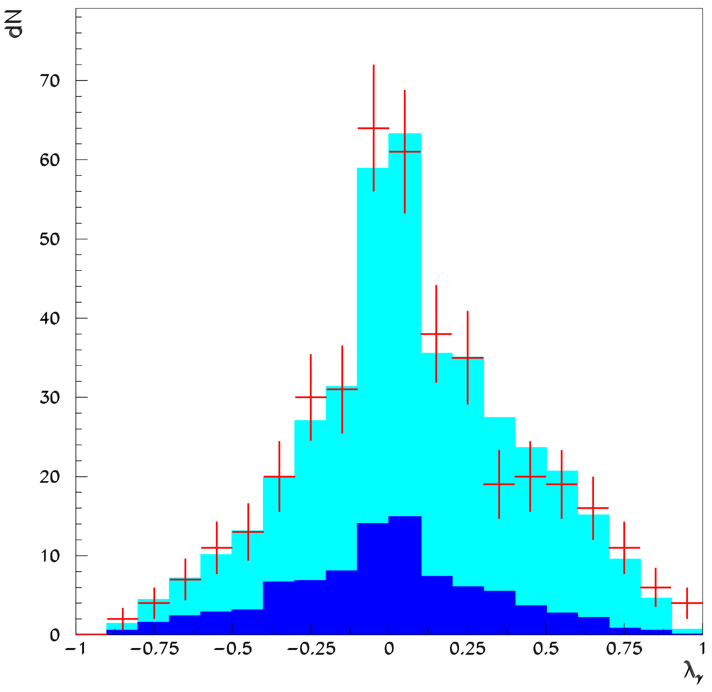


Log likelihood for distribution dependence on Δg_Z^1.

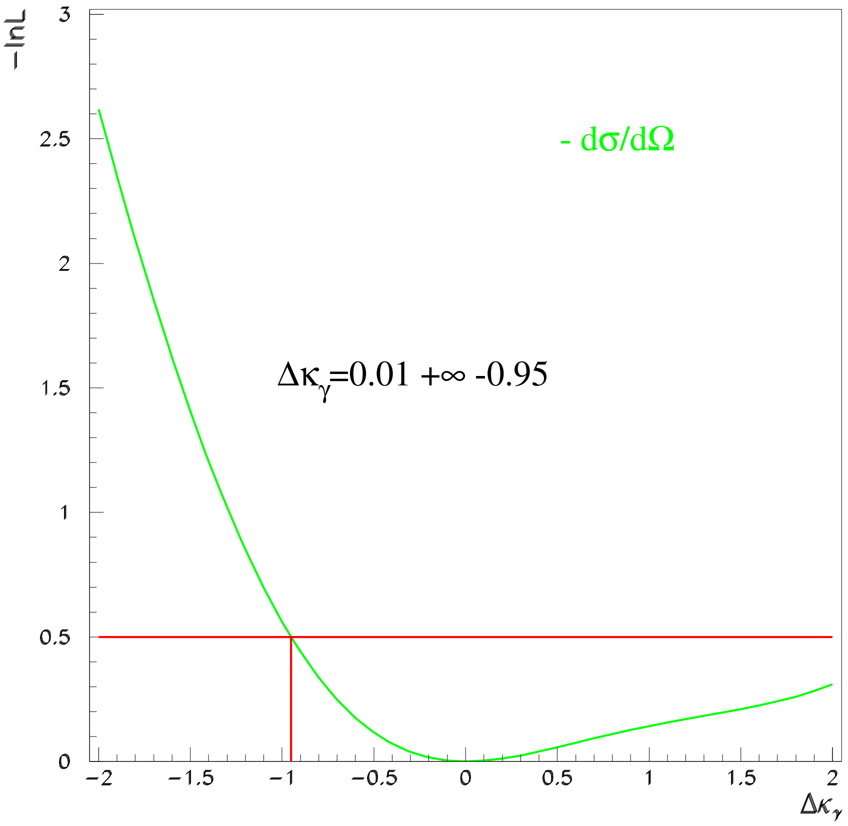


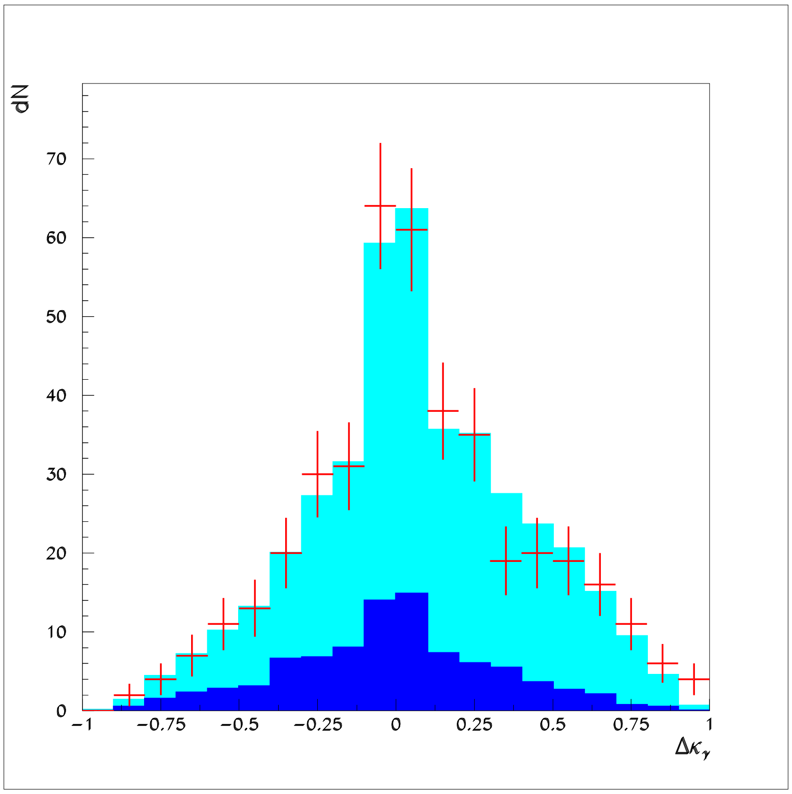
Best data-MC match for $\Delta g_Z^1 = 0.0$.





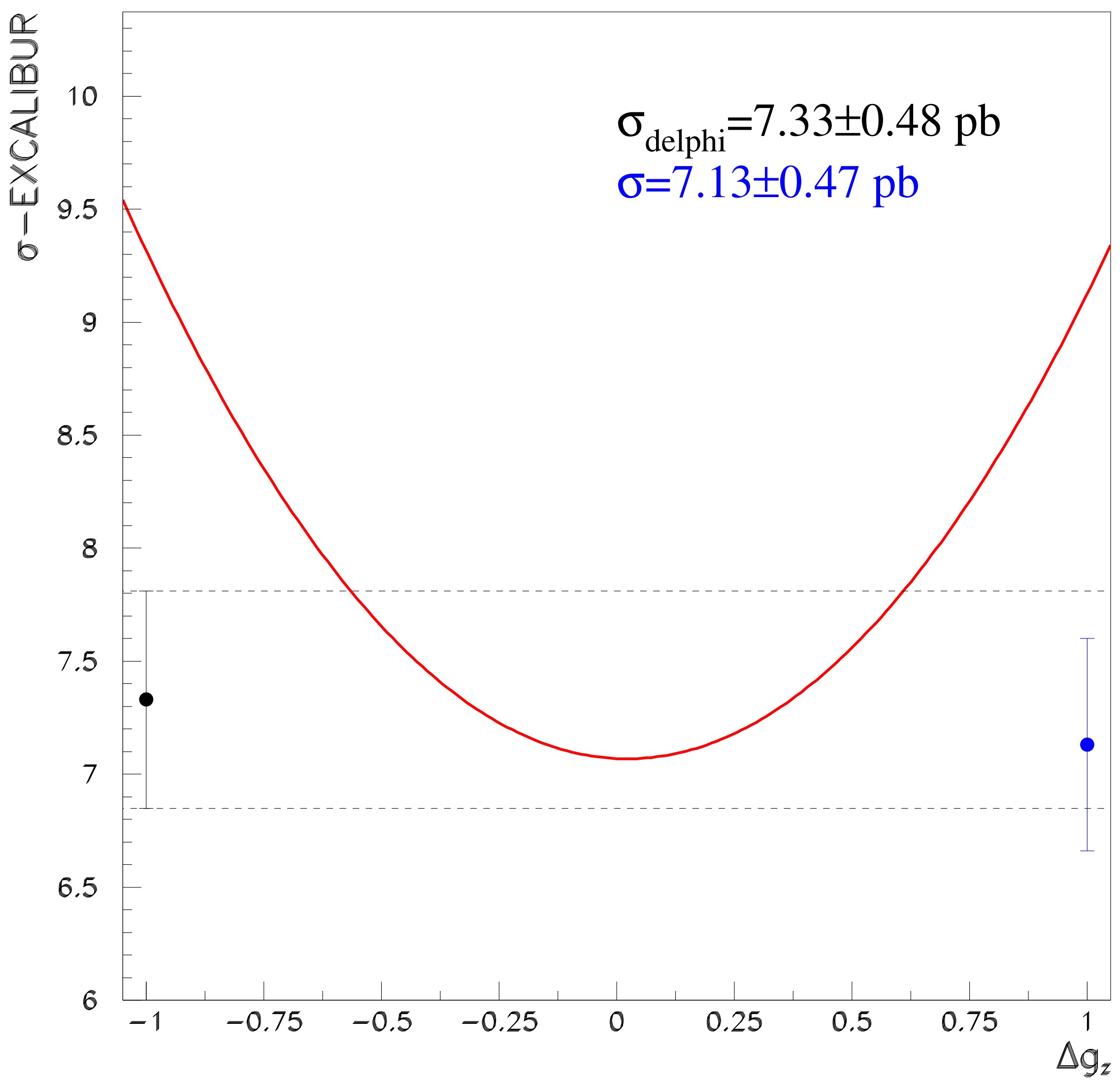
Best data-MC match for λ_γ=0.0



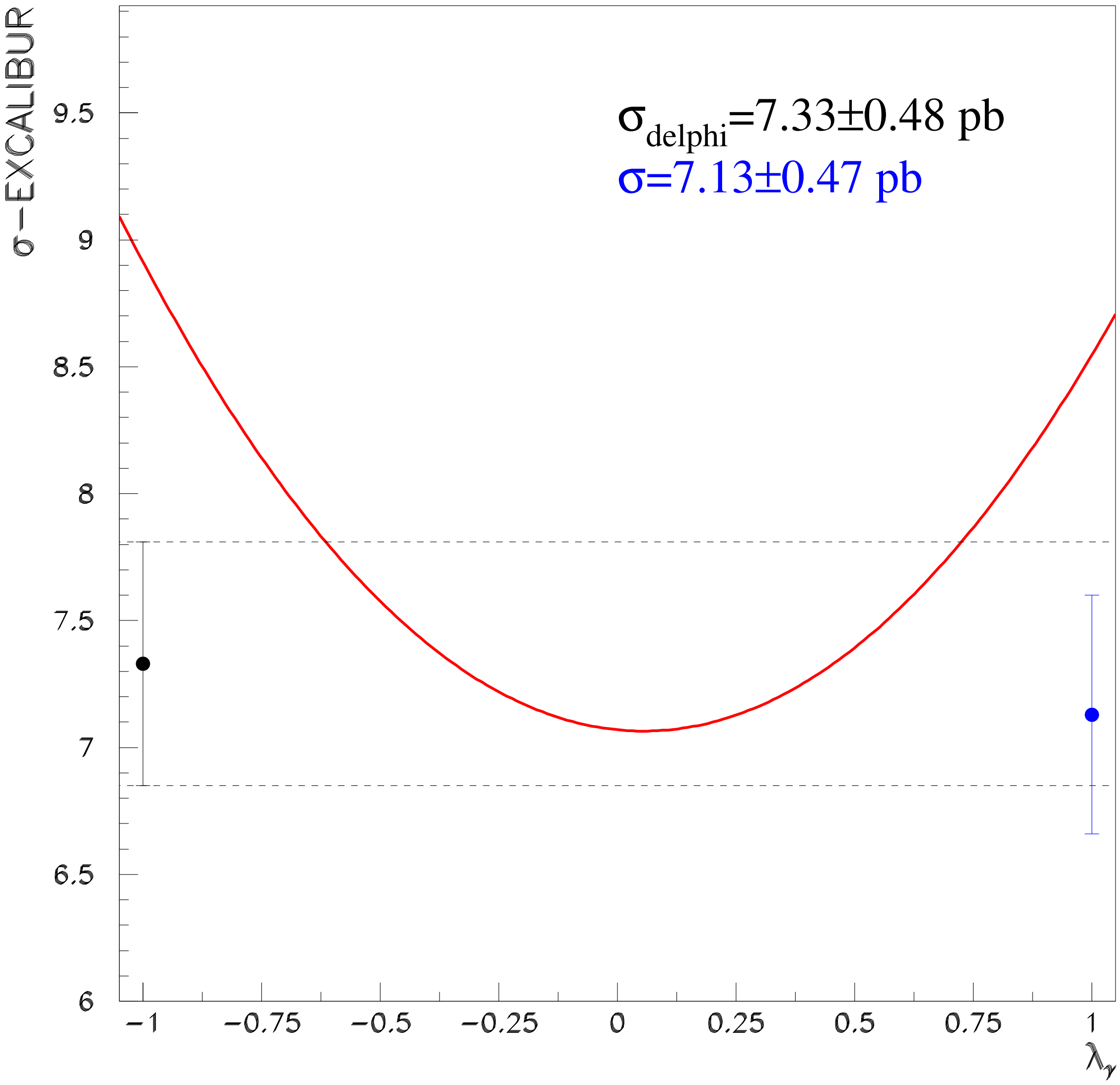


Best data-MC match for $\Delta\kappa_\gamma$=-0.1.

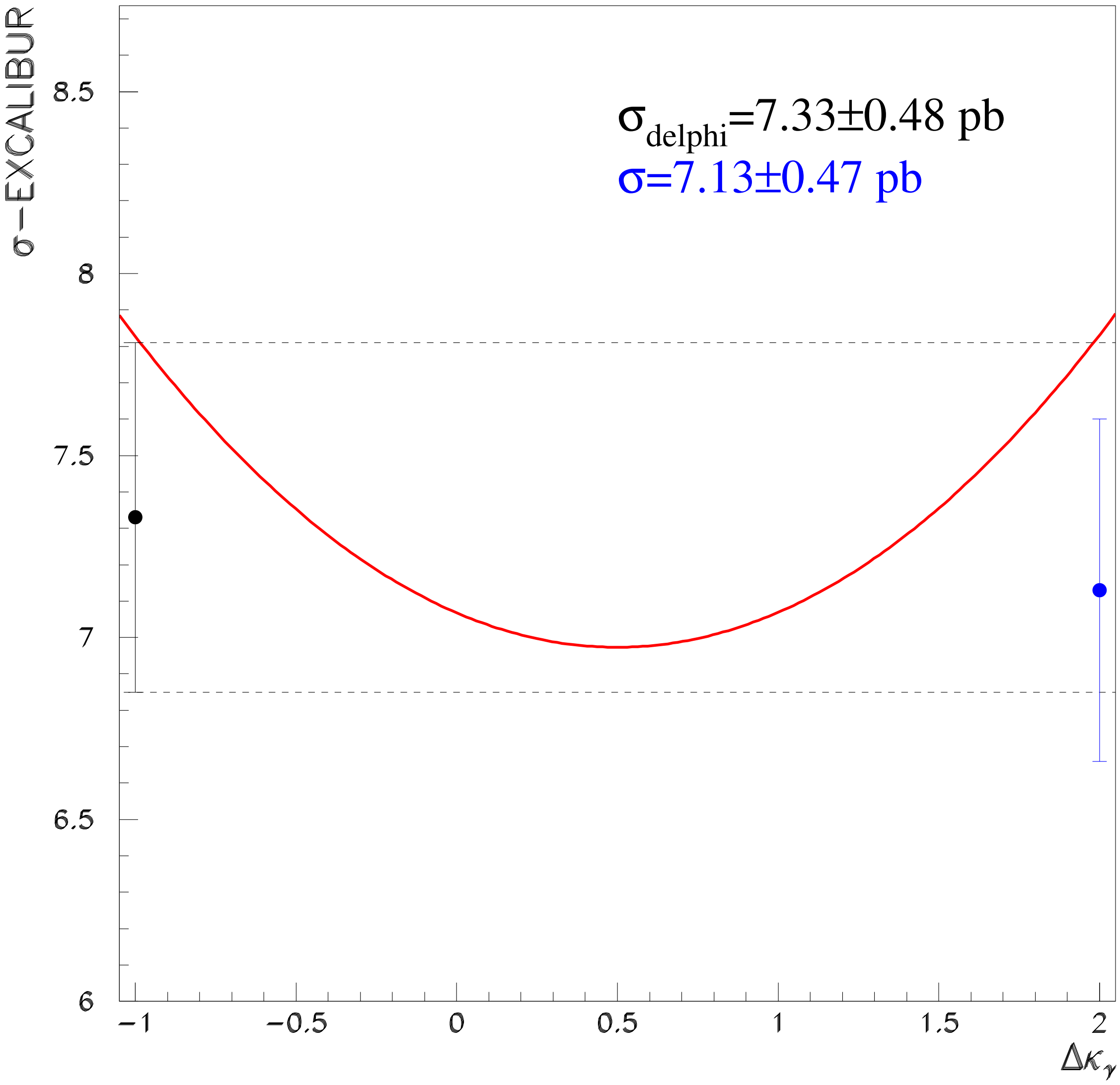
$4q$ cross-section



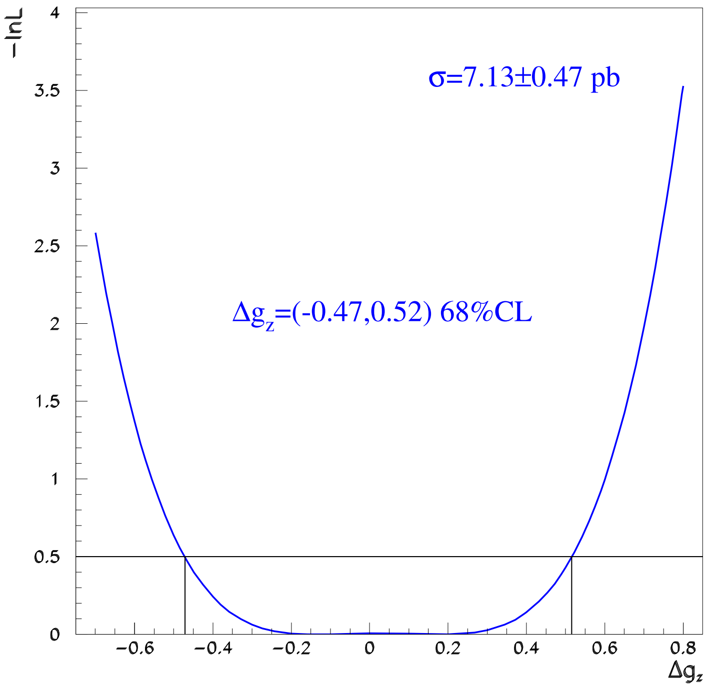
Cross-section dependence on Δg_Z^1.

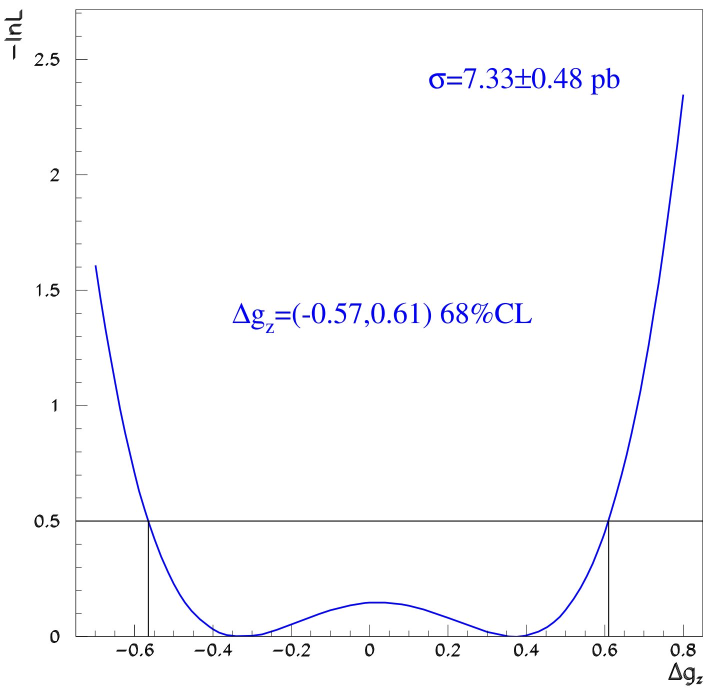


Cross-section dependence on λ_γ.

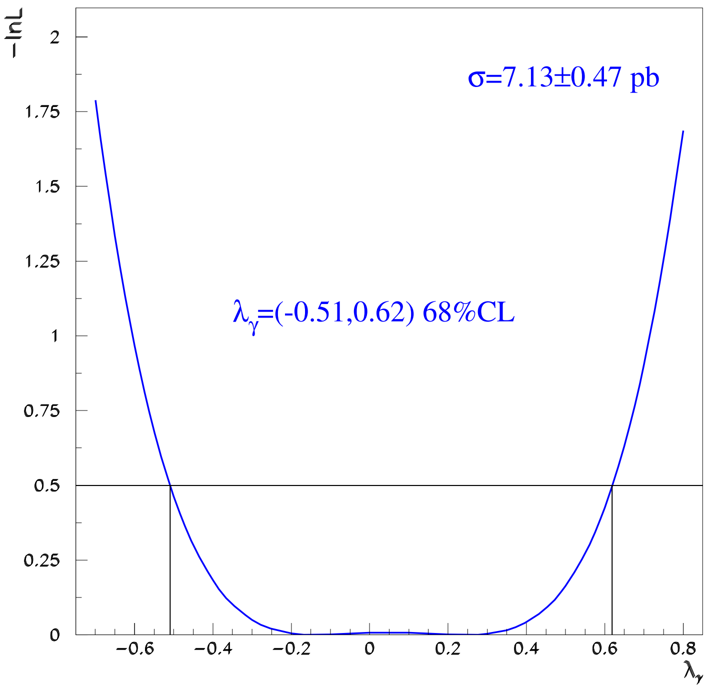


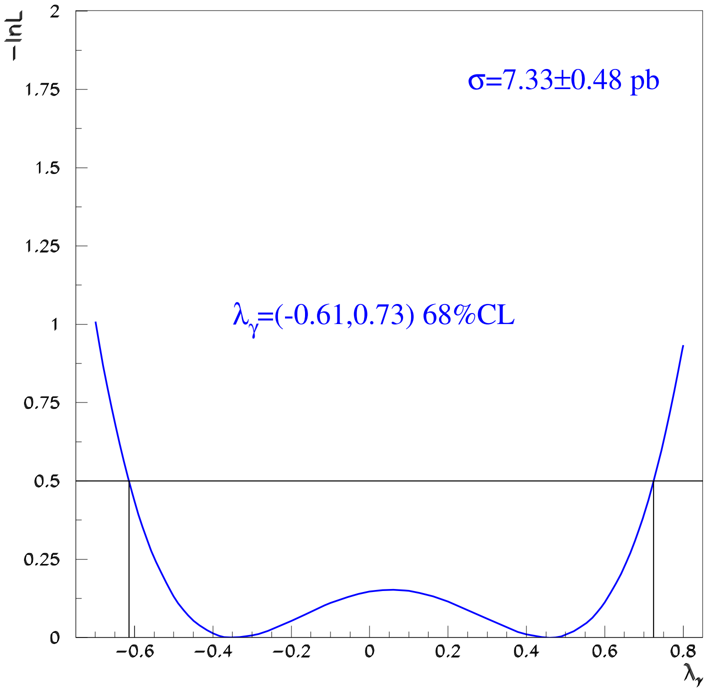
Cross-section dependence on $\Delta\kappa_\gamma$.



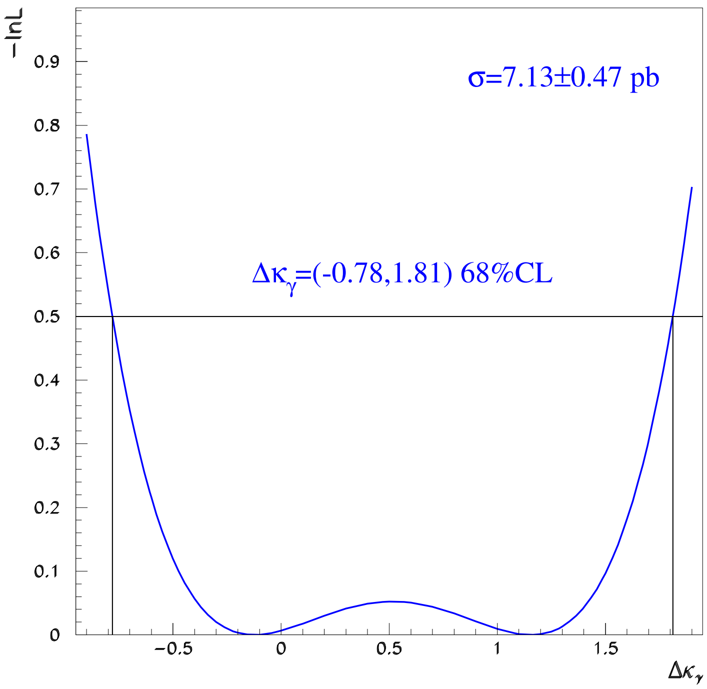


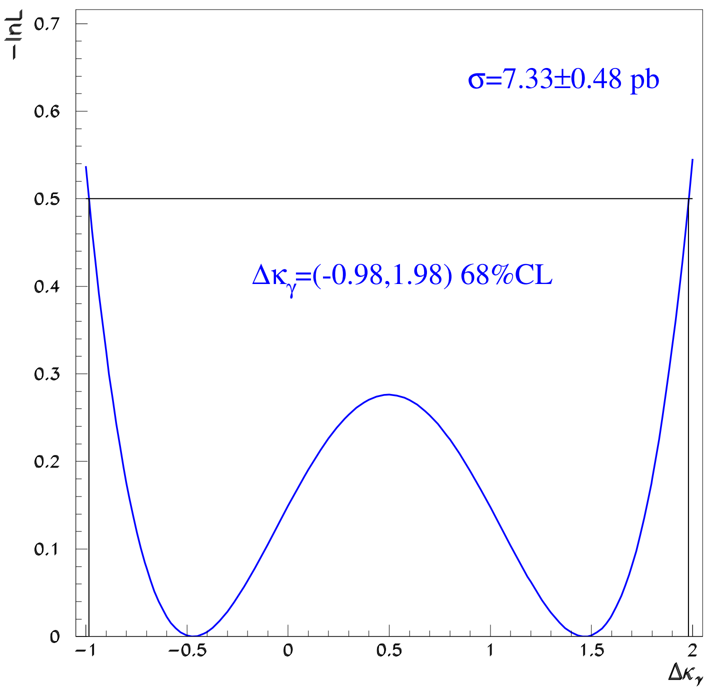
Log likelihood for cross-section dependence on Δg_Z^1.





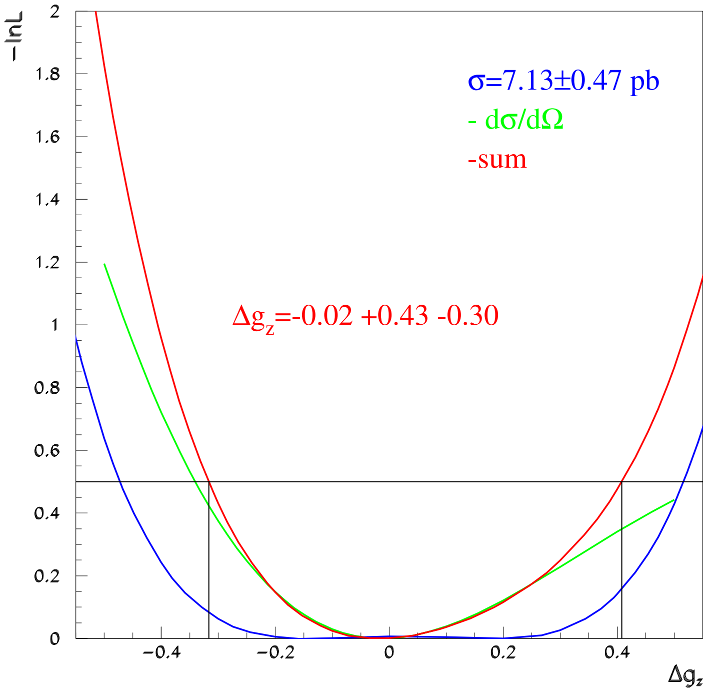
Log likelihood for cross-section dependence on λ_γ.

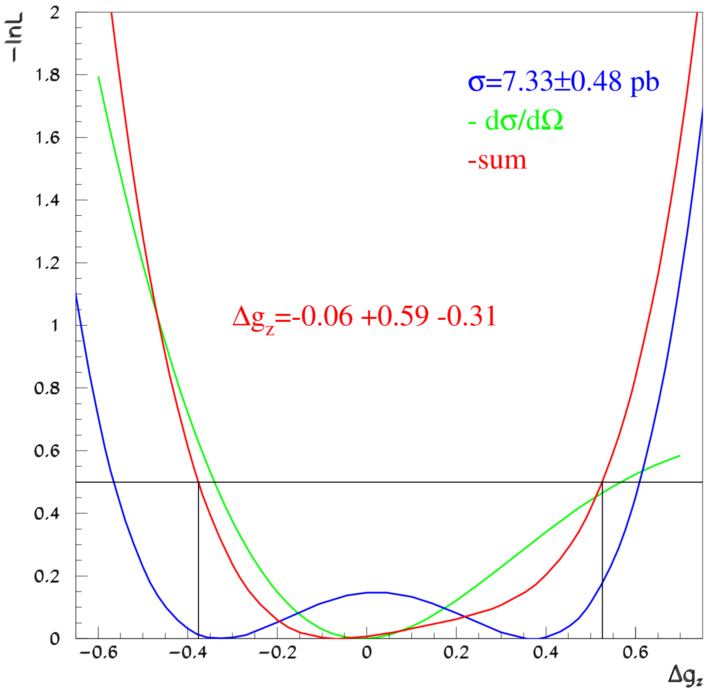


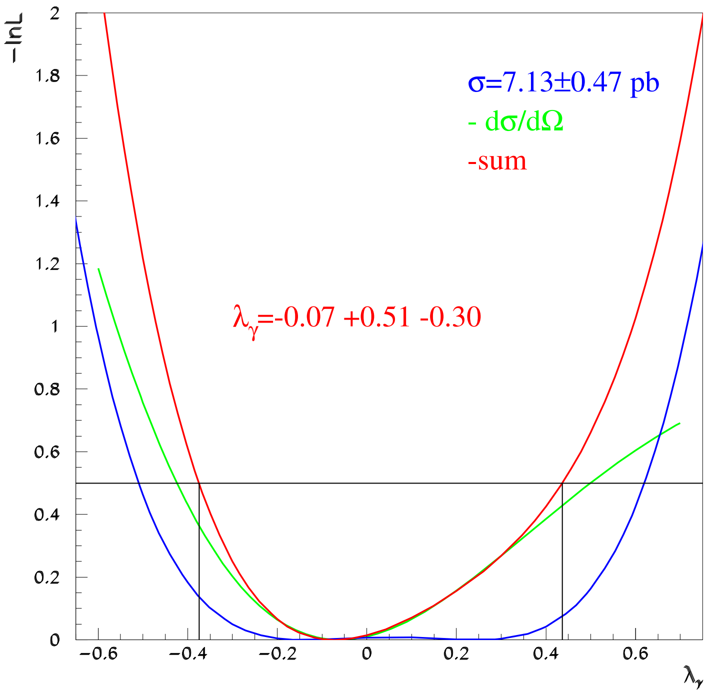


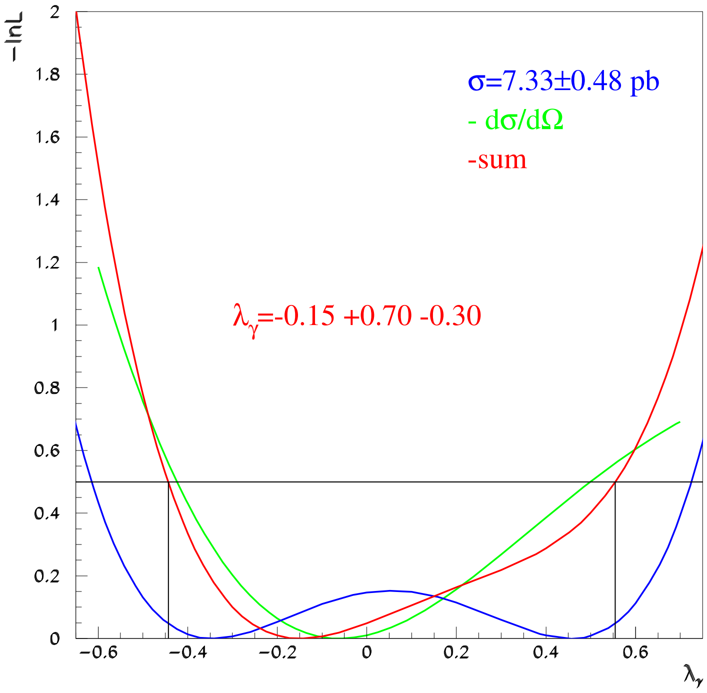
Log likelihood for cross-section dependence on $\Delta\kappa_\gamma$.

Combined results

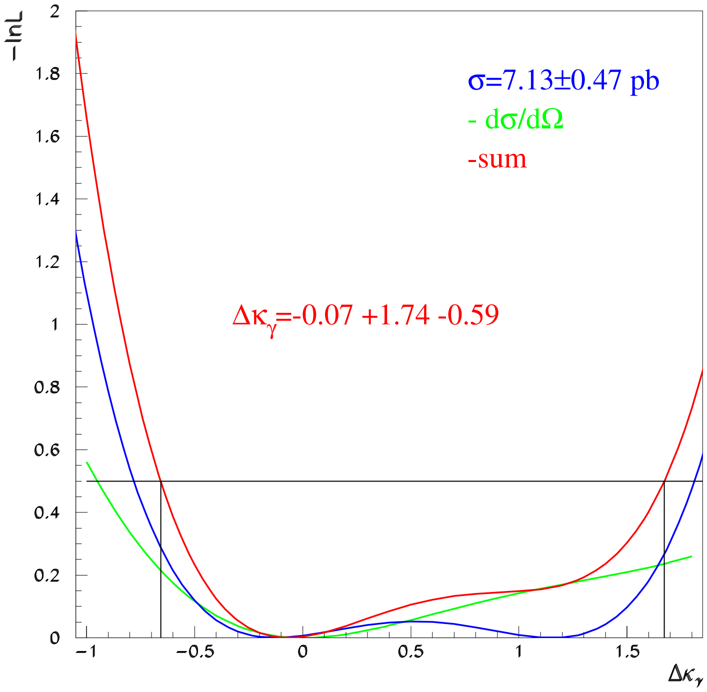


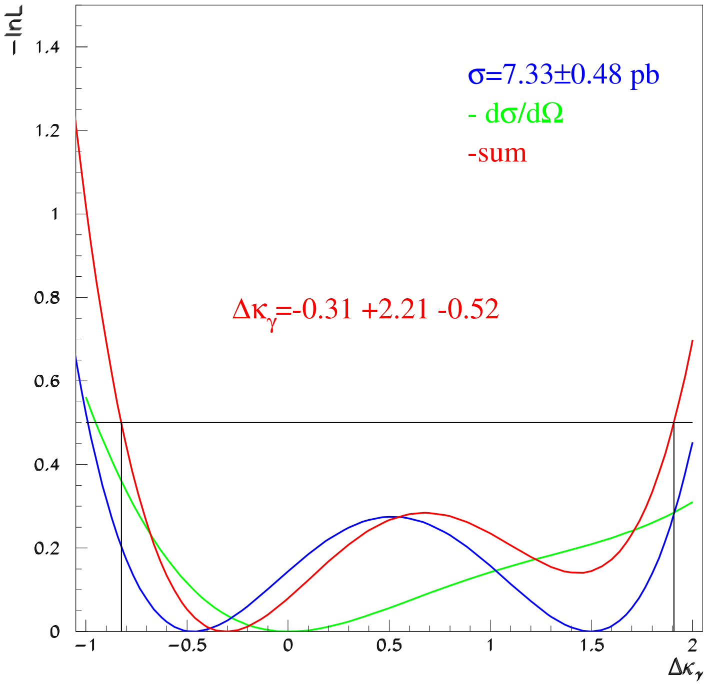






Combined log likelihood for λ_γ using distribution and cross-section dependence.

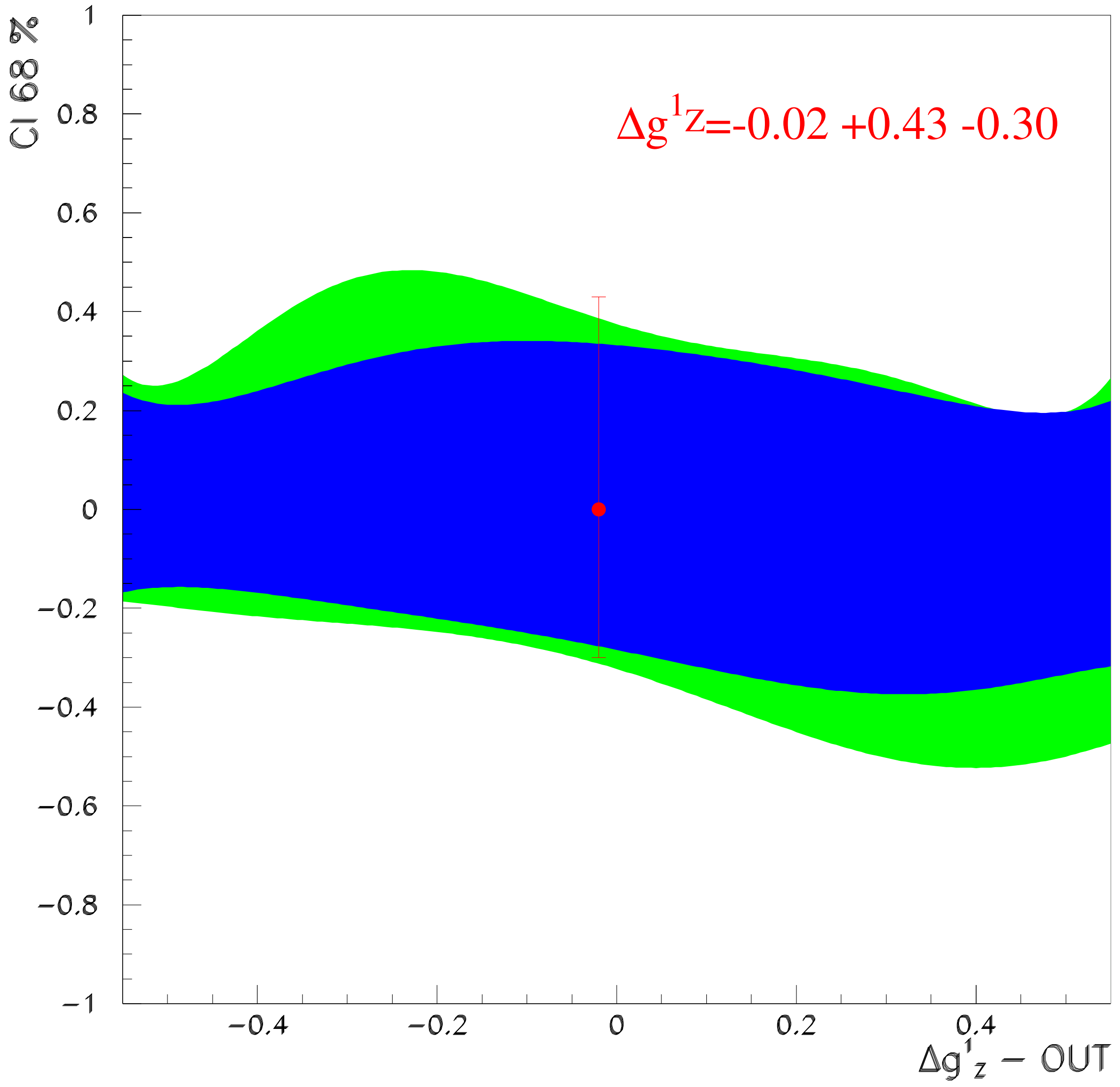


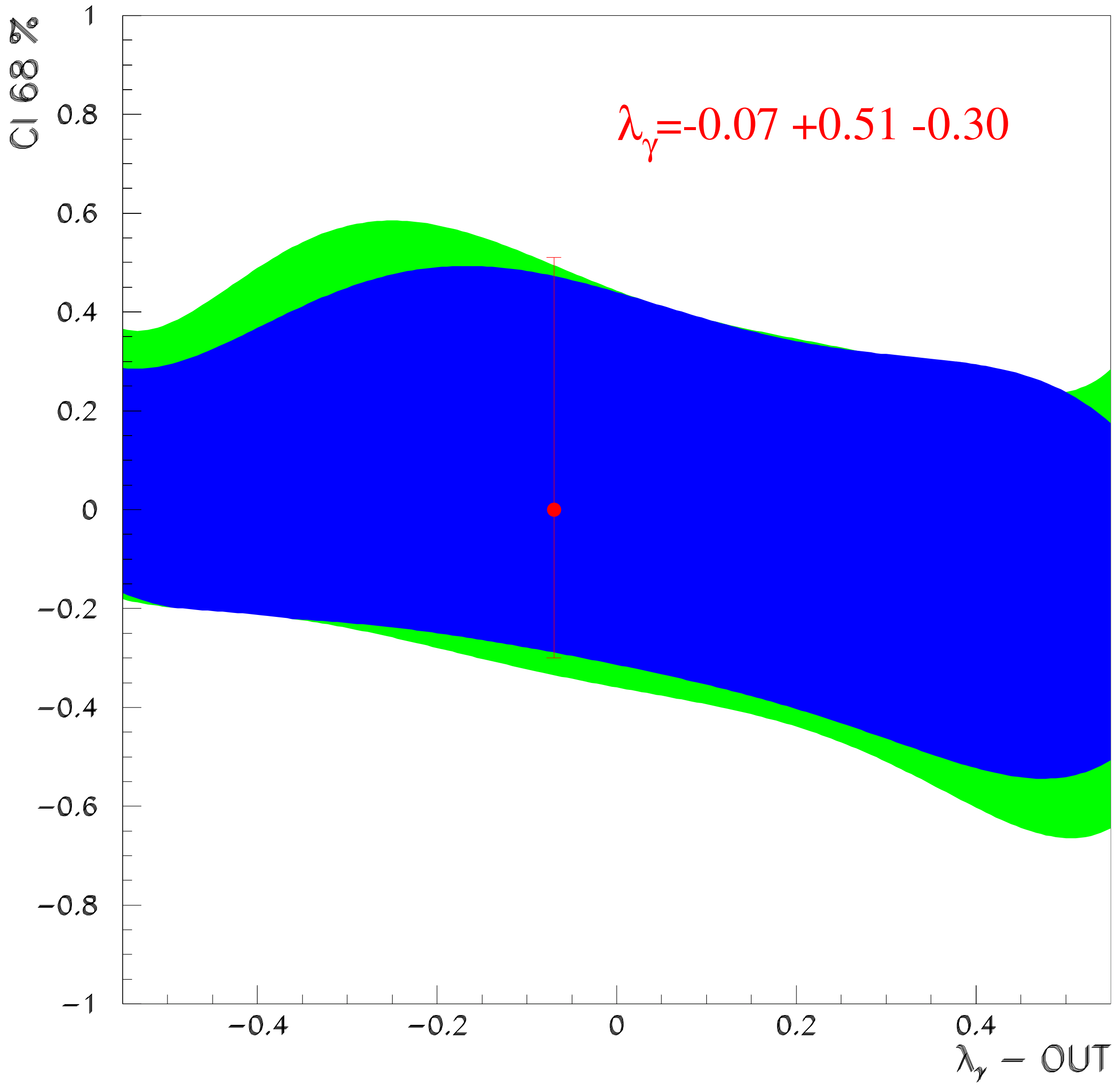


Combined log likelihood for $\Delta\kappa_\gamma$ using distribution and cross-section dependence.

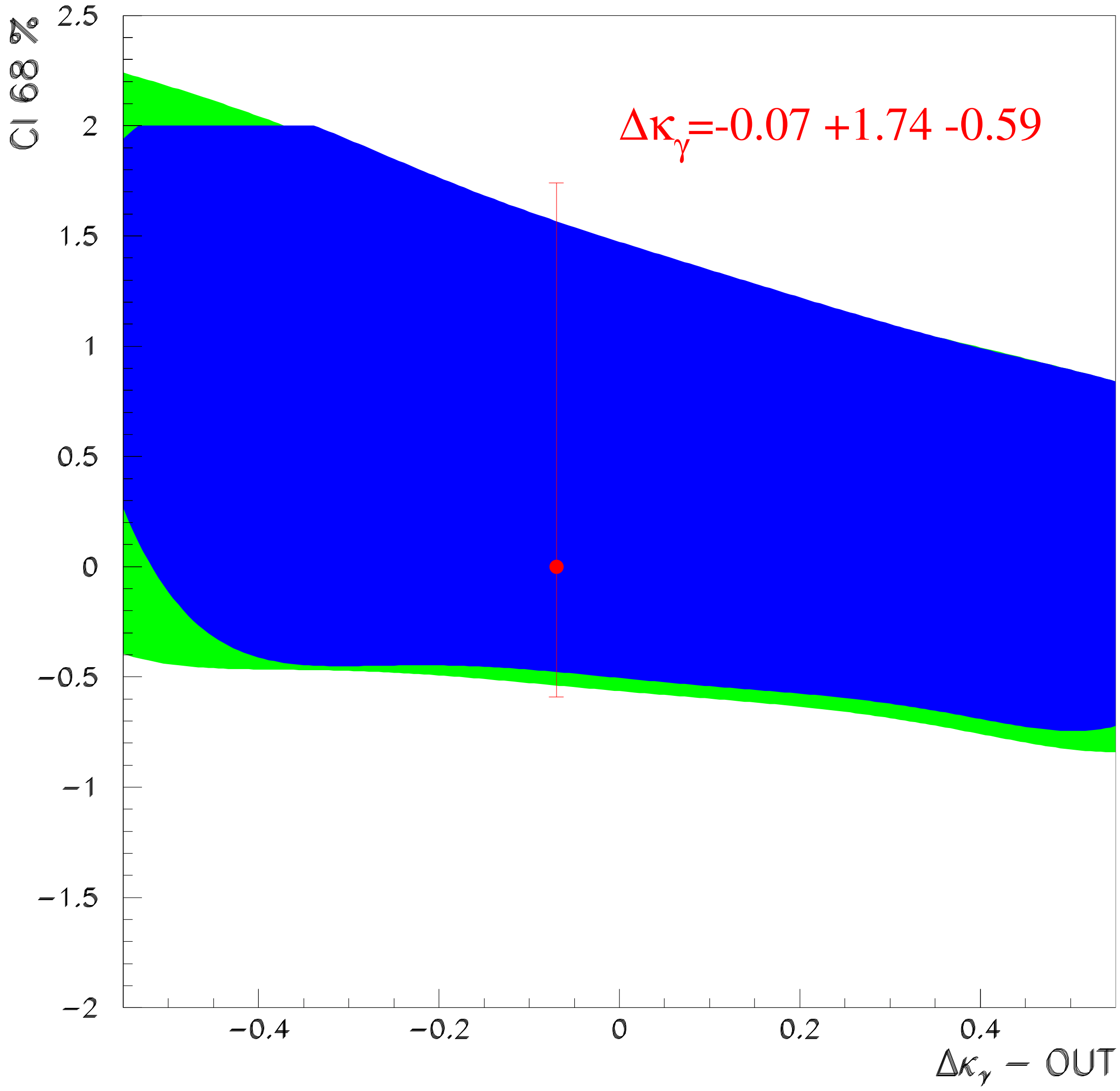
Expected errors

Distribution of expected errors according to TGC parameters. The green area is the expected error of folded $\cos\theta_{W-}$ and the blue area the expected error of optimal observables. The obtained result is drawn as a red error bar.





CI 68 %
λ_γ=-0.07 +0.51 -0.30
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
−0.4
−0.2
0
0.2
0.4
λ_γ − OUT



$\Delta\kappa_\gamma$=-0.07 +1.74 -0.59
CI 68 %
2.5
2
1.5
1
0.5
0
−0.5
−1
−1.5
−2
−0.4
−0.2
0
0.2
0.4
$\Delta\kappa_\gamma$ − OUT

Conclusion

Results:

method	Δg_z	λ_γ	$\Delta\kappa_\gamma$
distribution	-0.01 $^{+0.58}_{-0.33}$	-0.06 $^{+0.56}_{-0.36}$	0.01 $^{+\infty}_{-0.95}$
σ	[-0.47,0.52]	[-0.51,0.62]	[-0.78,1.81]
combined	-0.02 $^{+0.43}_{-0.30}$	-0.07 $^{+0.51}_{-0.30}$	-0.07 $^{+1.74}_{-0.59}$
comb - σ_{del}	-0.06 $^{+0.59}_{-0.31}$	-0.15 $^{+0.70}_{-0.30}$	-0.31 $^{+2.21}_{-0.52}$