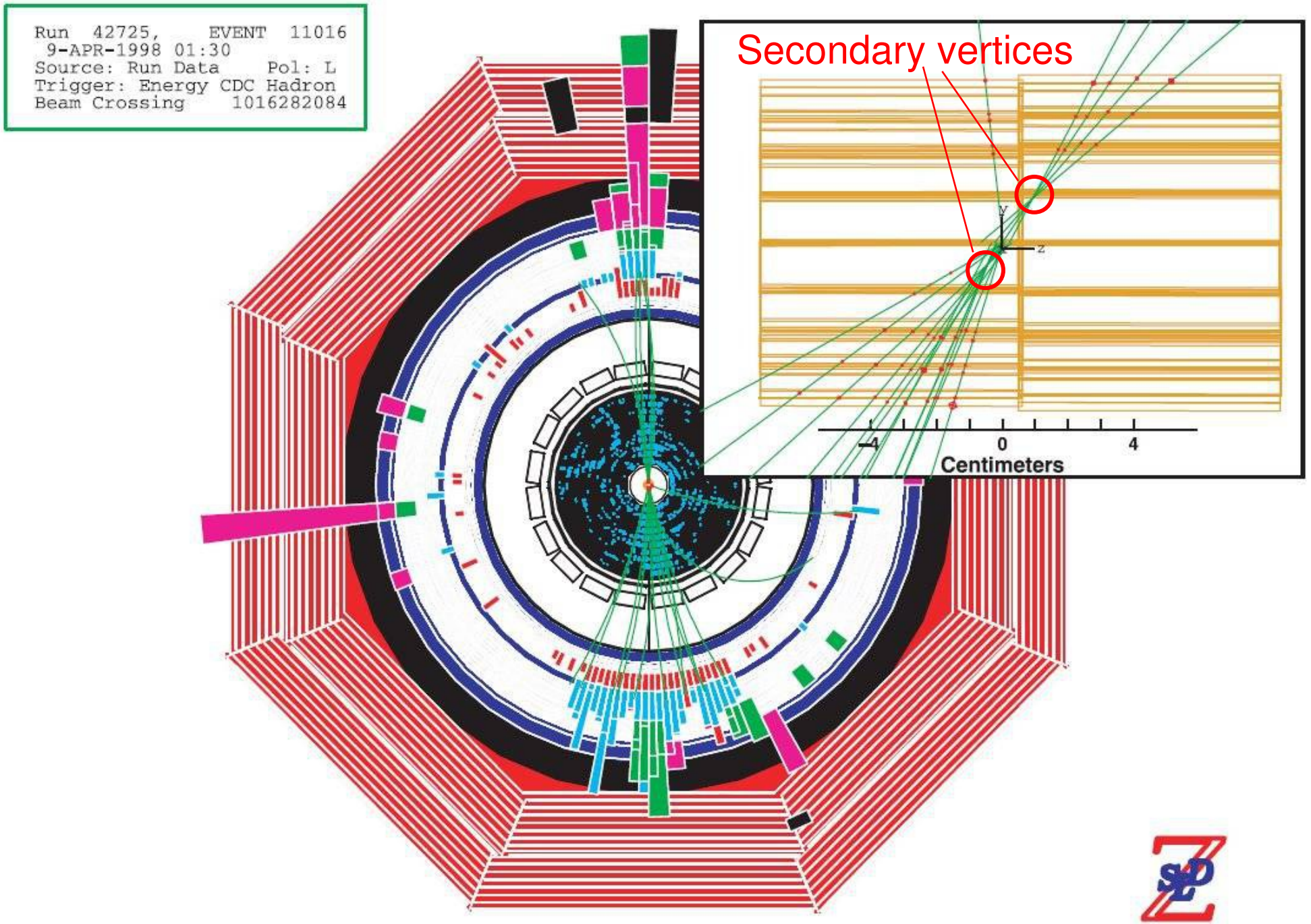
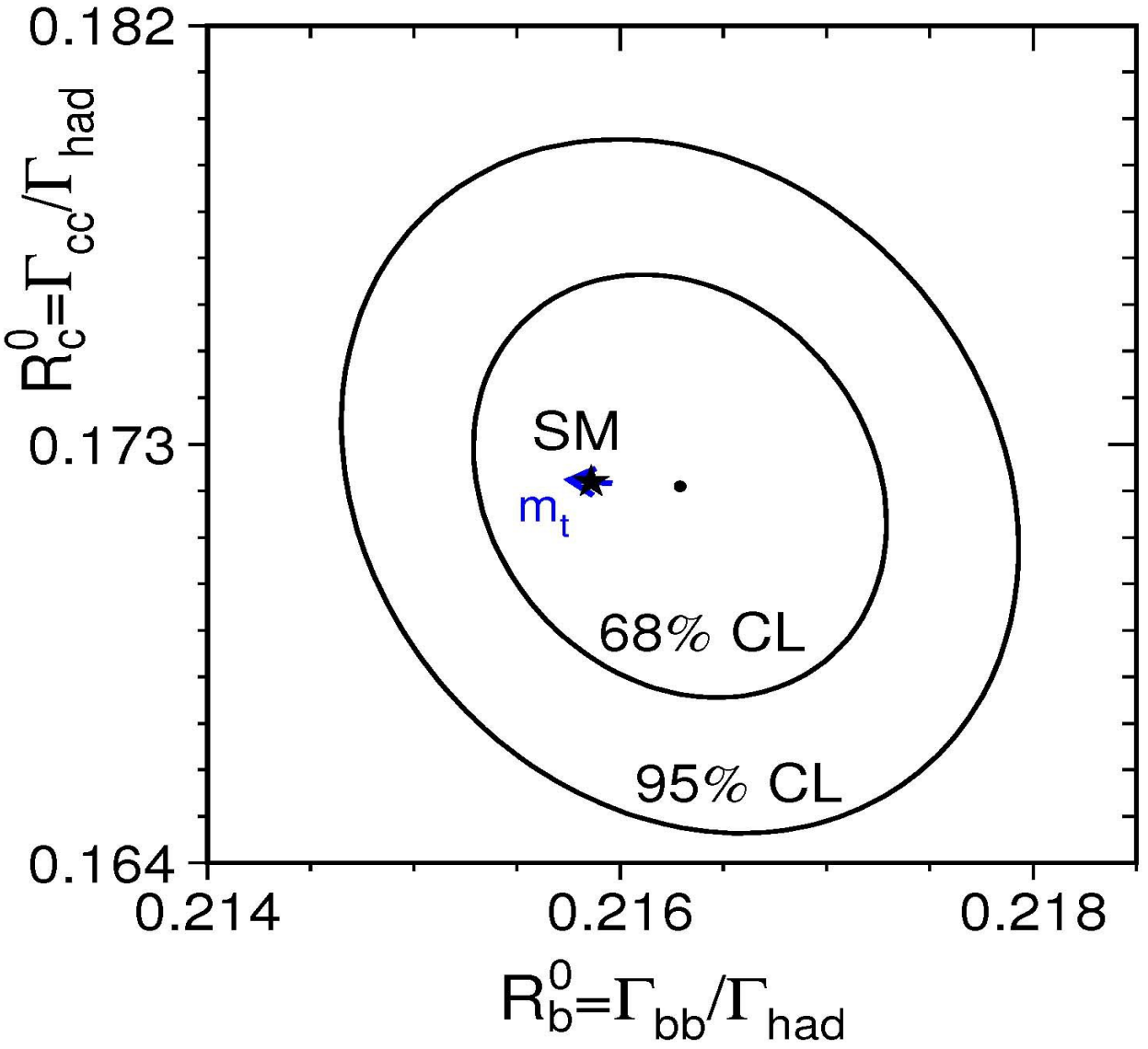
Selection: $e^+e^- \to c\bar{c}, b\bar{b}$:



$R_c = 0.1721 \pm 0.0030$



Why do R_c and R_b have different values?

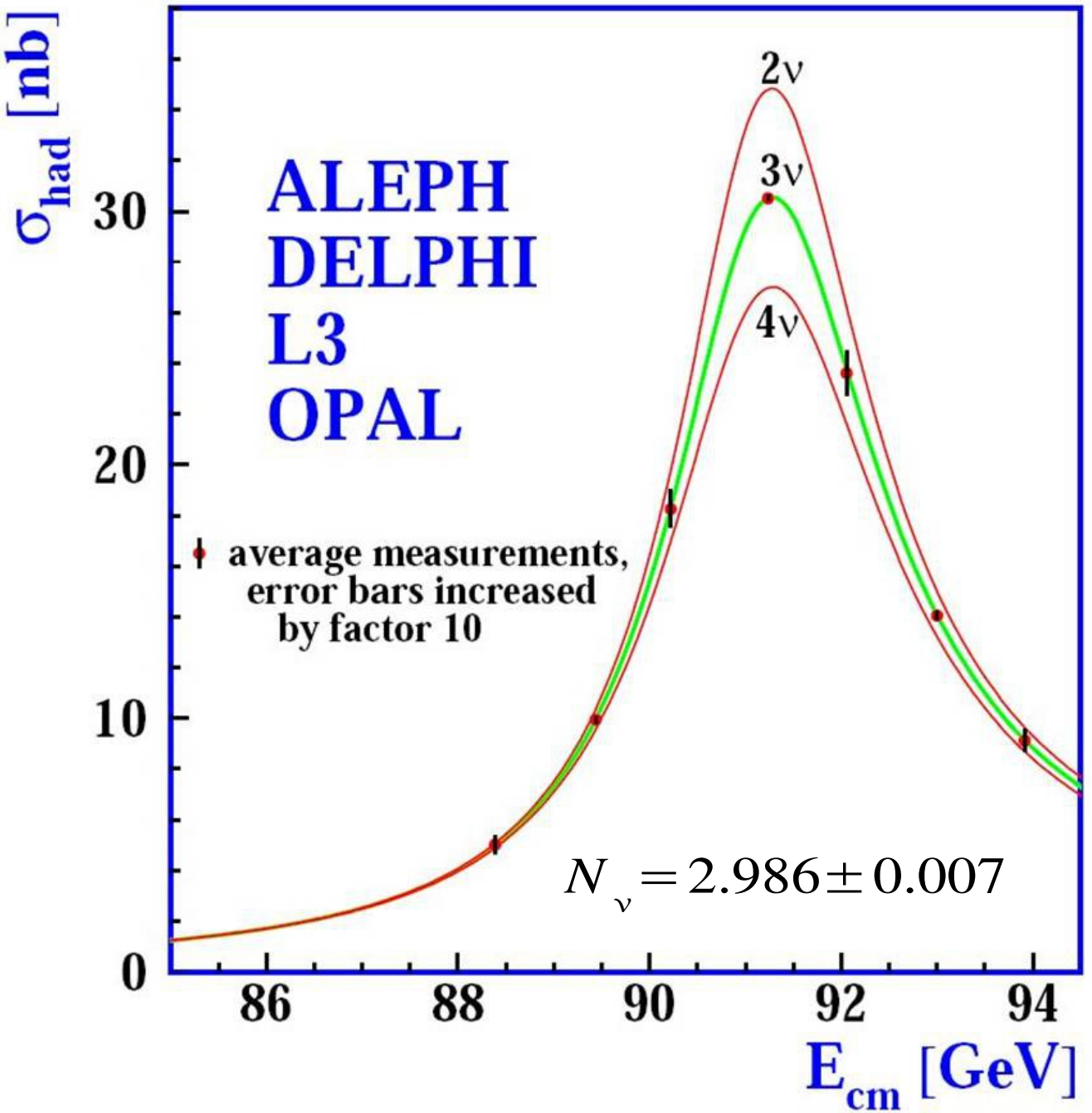
Why is R_b sensitive to m_t?

$R_b = 0.21629 \pm 0.00066$

3.2.5 Number of light neutrino flavors

Z-Resonance curve for different N_ν

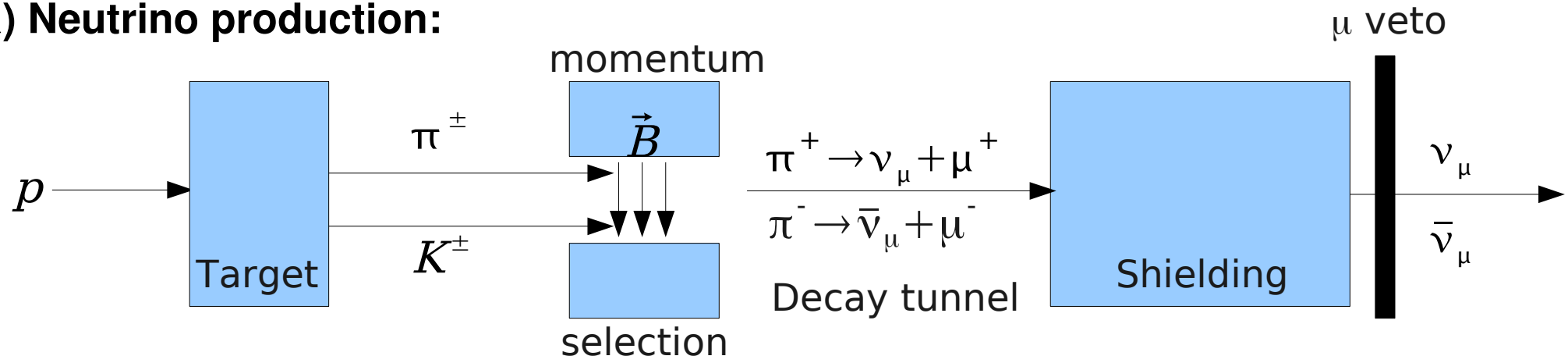
$$\Gamma_h = \Gamma_Z - \Gamma_e - \Gamma_\mu - \Gamma_\tau - N_\nu \cdot \Gamma_\nu$$



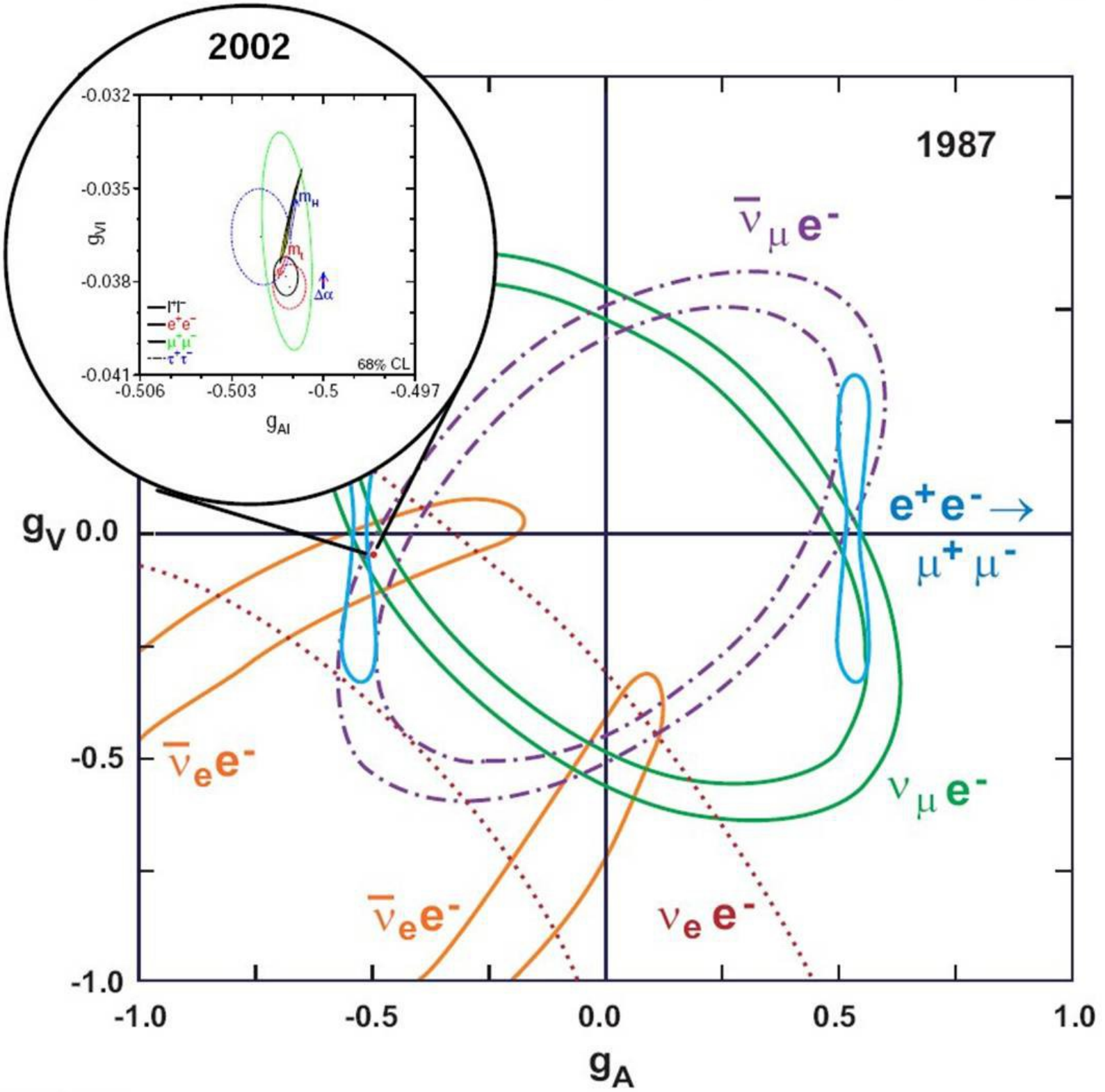
3.3 Couplings to leptons

3.3.1 Neutrino-Electron Scattering

a) Neutrino production:



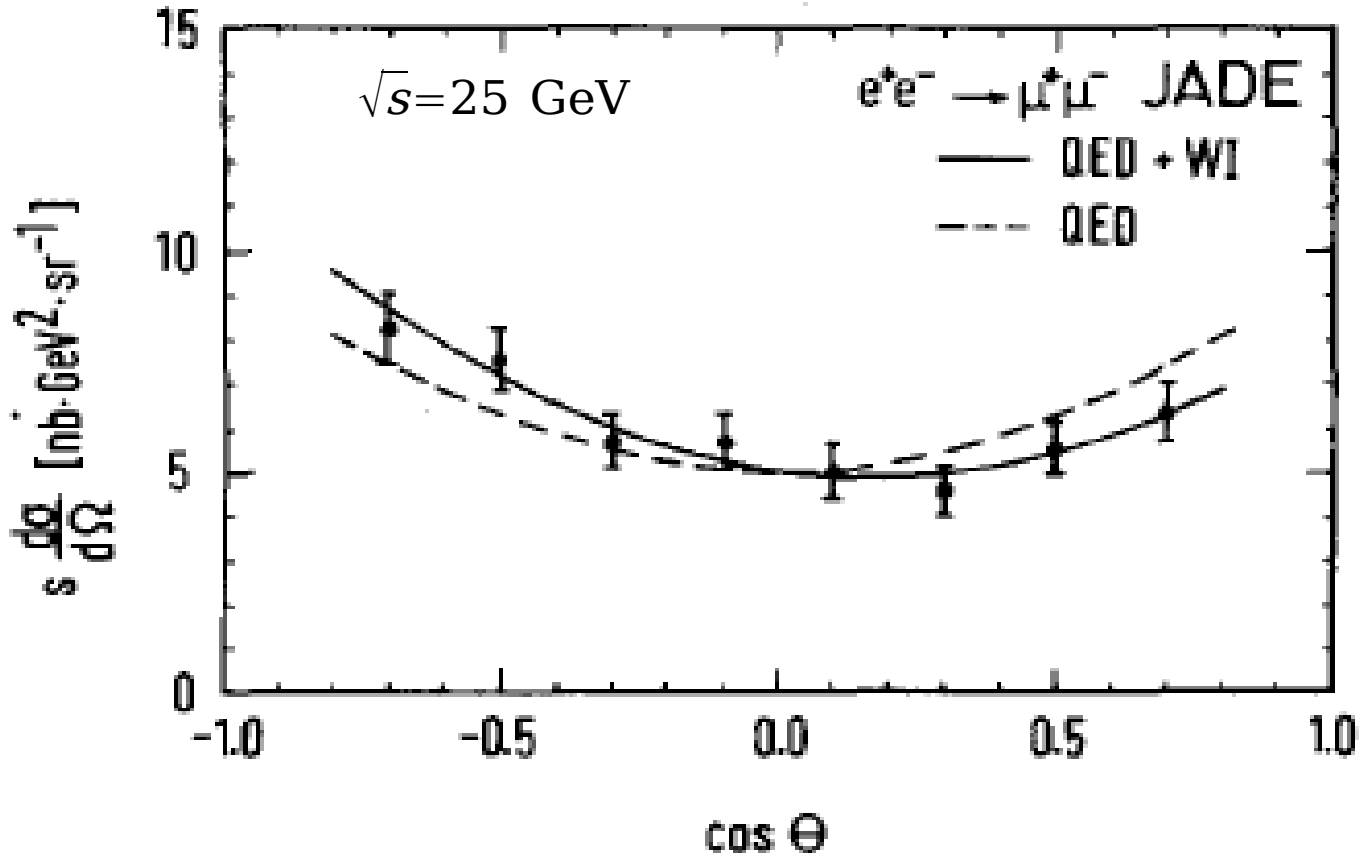
b) Scattering off a target containing many electrons:


2002
-0.032
-0.035
-0.038
-0.041
g_{VI}
m_H
m_t
$\Delta\alpha$
l^+l^-
e^+e^-
$\mu^+\mu^-$
$\tau^+\tau^-$
68% CL
-0.506
-0.503
-0.5
-0.497
g_{AI}
1987
$\bar{\nu}_\mu e^-$
$e^+e^- \rightarrow$
$\mu^+\mu^-$
$\bar{\nu}_e e^-$
$\nu_\mu e^-$
$\bar{\nu}_e e^-$
$\nu_e e^-$
g_V 0.0
-0.5
-1.0
-1.0
-0.5
0.0
0.5
1.0
g_A

3.3.2 Electron-Positron Annihilation

a) PEP (SLAC) / PETRA (DESY): $\sqrt{s} \ll M_Z$: e.g. $e^+ e^- \to \mu^+ \mu^-$

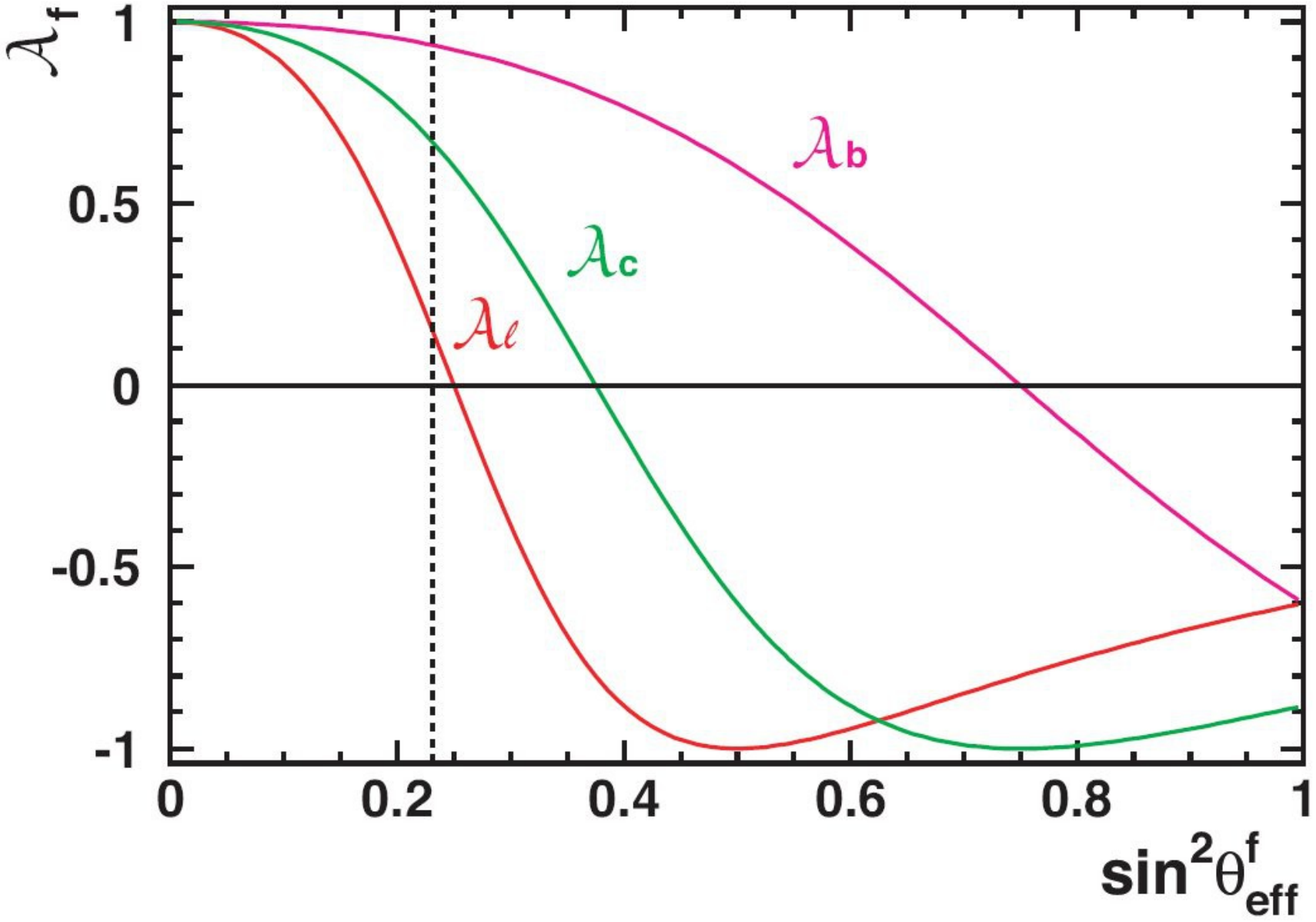
3.3.2 Electron-Positron Annihilation



3.3.2 Electron-Positron Annihilation

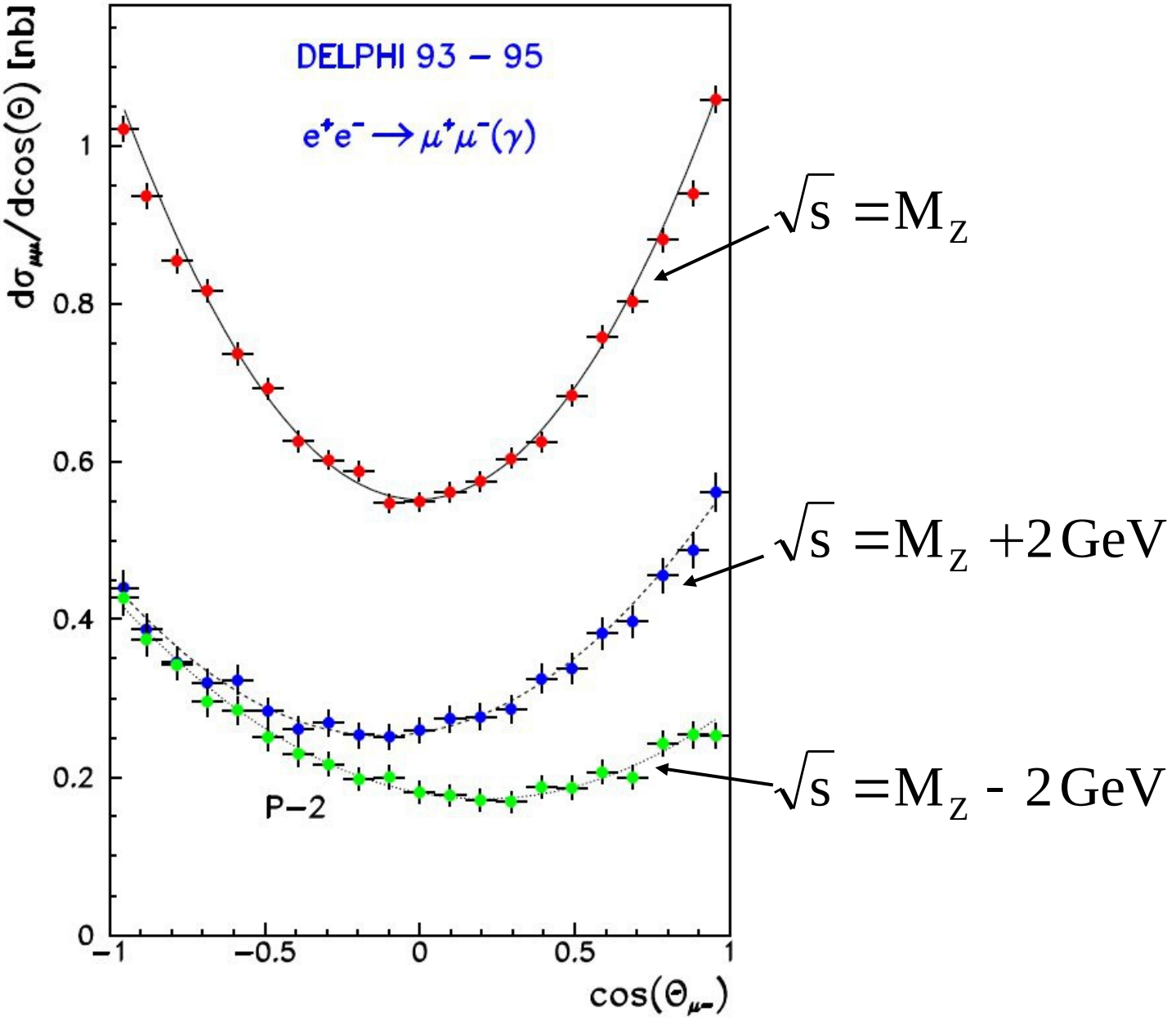
Sensitivity of Asymmetry Factors wrt Mixing Angle

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



Angular Distribution of Muon Pairs

Why does the asymmetry term change sign when passing the resonance?



Measurement of Right-Left-Asymmetry at Linear-Collider SLC

Why is $A_{RL}^{e} \neq A_{RL}^{\mu,\tau}$?