below. The parameter $\sin^2\theta_W$ can be determined from the Z-pole observables and M_W, and from a variety of neutral-current processes spanning a very wide Q^2 range. The results [9], shown in Table 26.4 of the full *Review*, are in impressive agreement with each other, indicating the quantitative success of the Standard Model. The one discrepancy is the value $\widehat{s}^2_Z = 0.2292 \pm 0.0010$ from A^0_{LR} which is 2.4σ below the value (0.2319 ± 0.005) from the global fit to all data and 2.8σ below the value 0.2323 ± 0.0005 obtained from all data other than A^0_{LR}.

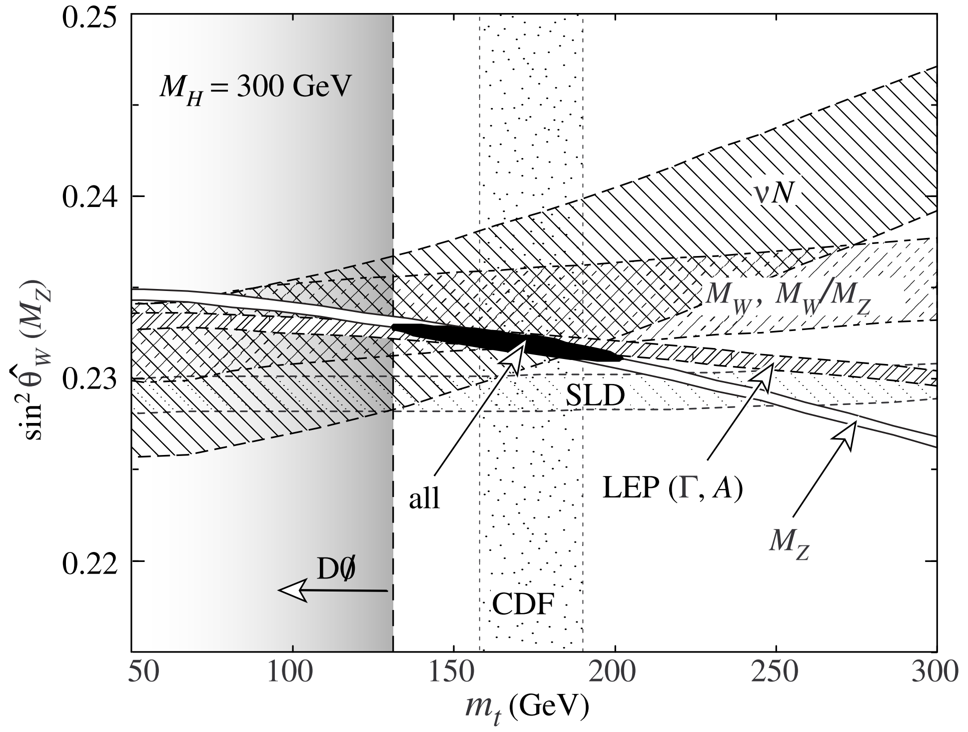

Figure 26.1: One-standard-deviation uncertainties in $\sin^2\widehat{\theta}_W$ as a function of m_t, the direct constraint $m_t > 131$ GeV, the CDF range 174 ± 16 GeV, and the 90% CL region in $\sin^2\widehat{\theta}_W - m_t$ allowed by all data, assuming $M_H = 300$ GeV.

The data allow a simultaneous determination of $\sin^2\theta_W$, m_t, and the strong coupling $\alpha_s(M_Z)$. The latter is determined mainly from Γ_Z and R, and is almost uncorrelated from the other variables. The global fit to all indirect data yields

$$\widehat{s}^2_Z = 0.2319 \pm 0.0005 \pm 0.0002$$

$$m_t = 169^{+16+17}_{-18-20} \text{ GeV}$$

$$\alpha_s(M_Z) = 0.120 \pm 0.007 \pm 0.002 \;, \tag{26.38}$$