



Figure 12. Implications of precision measurements of M_t and M_W on the indirect extraction of the Higgs boson mass. The Standard Model allows only the shaded region.³

measurements.²⁵ In extensions of the Standard Model, such as those discussed in Section 5, a precise knowledge of M_t plays a critical role in defining the parameters of the theory.

The top quark mass was measured in Run I at the Tevatron and the most accurate value of M_t comes from the single lepton+jets channel,²

$$\begin{aligned}
 M_t &= 176.1 \pm 4.8 \text{ (stat)} \pm 5.3 \text{ (syst)} \quad CDF \\
 &= 173.3 \pm 5.6 \text{ (stat)} \pm 5.5 \text{ (syst)} \quad D0 \quad .
 \end{aligned}
 \tag{59}$$

In the lepton plus jets channel there is one unknown parameter (the longitudinal momentum of the ν coming from the W decay) and three constraints from the reconstruction of the W masses and the requirement that the reconstructed masses of the top and anti-top be identical, $M_t = M_{\bar{t}}$. The best value of the top quark mass found from combining all channels at the