



Λ Problem

Casimir energy: $\infty, \Lambda_{\text{susy}}^4$

condensates: $\Lambda_{\text{GUT}}^4, \Lambda_{\text{EW}}^4, \Lambda_{\text{QCD}}^4$

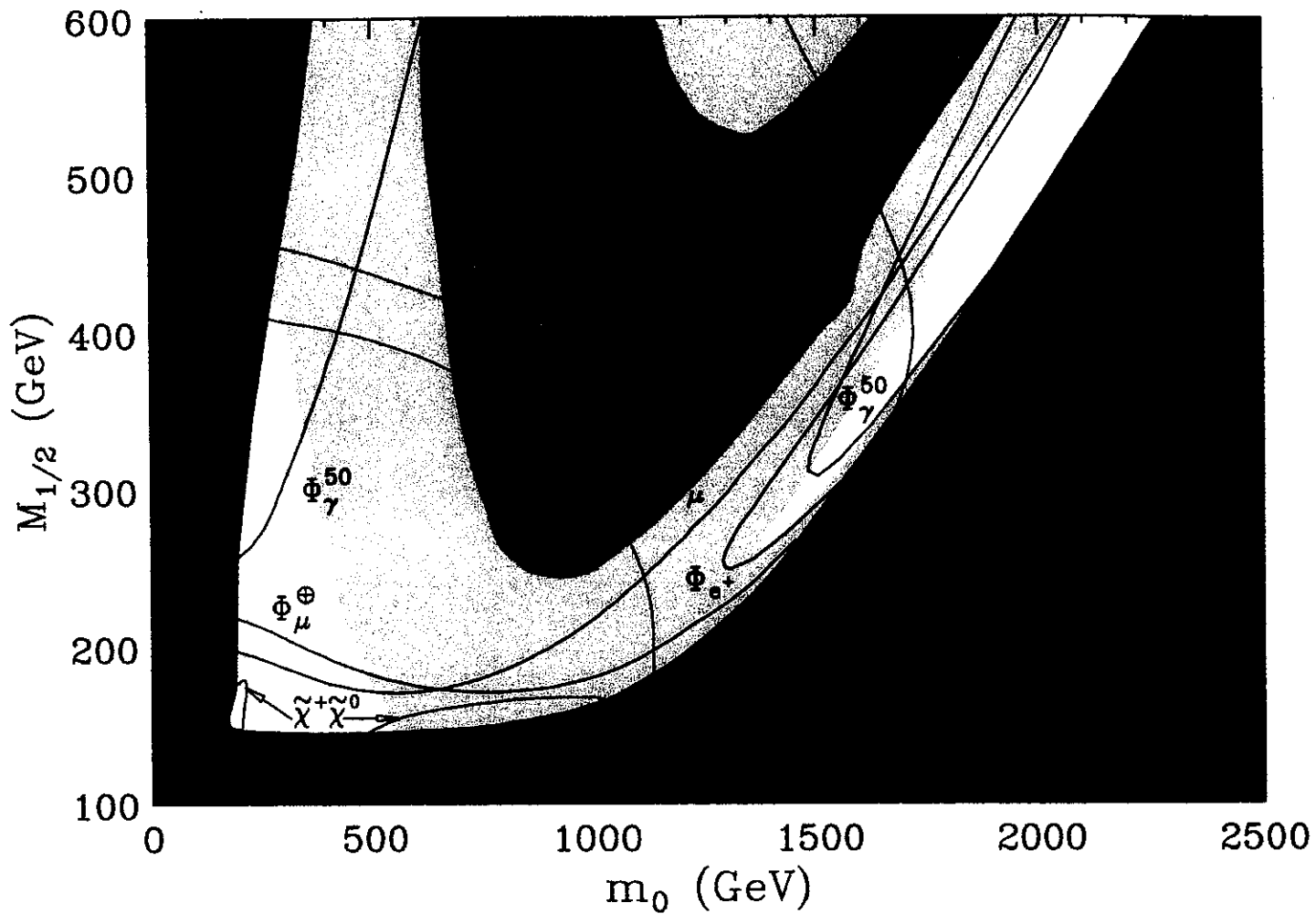
observed (?): $\sim (10^{-3} \text{ eV})^4$

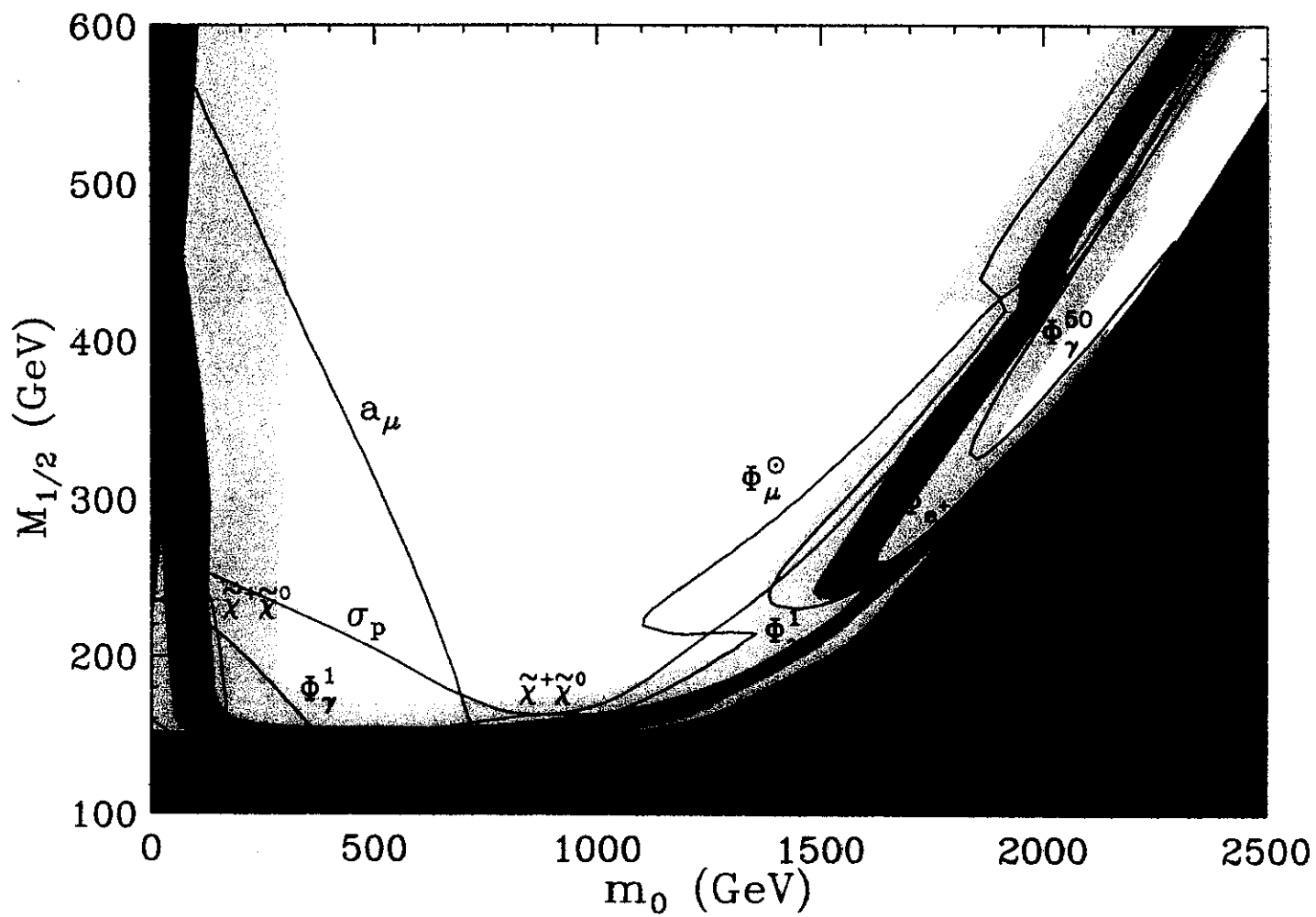
\lll all of above

numerology:

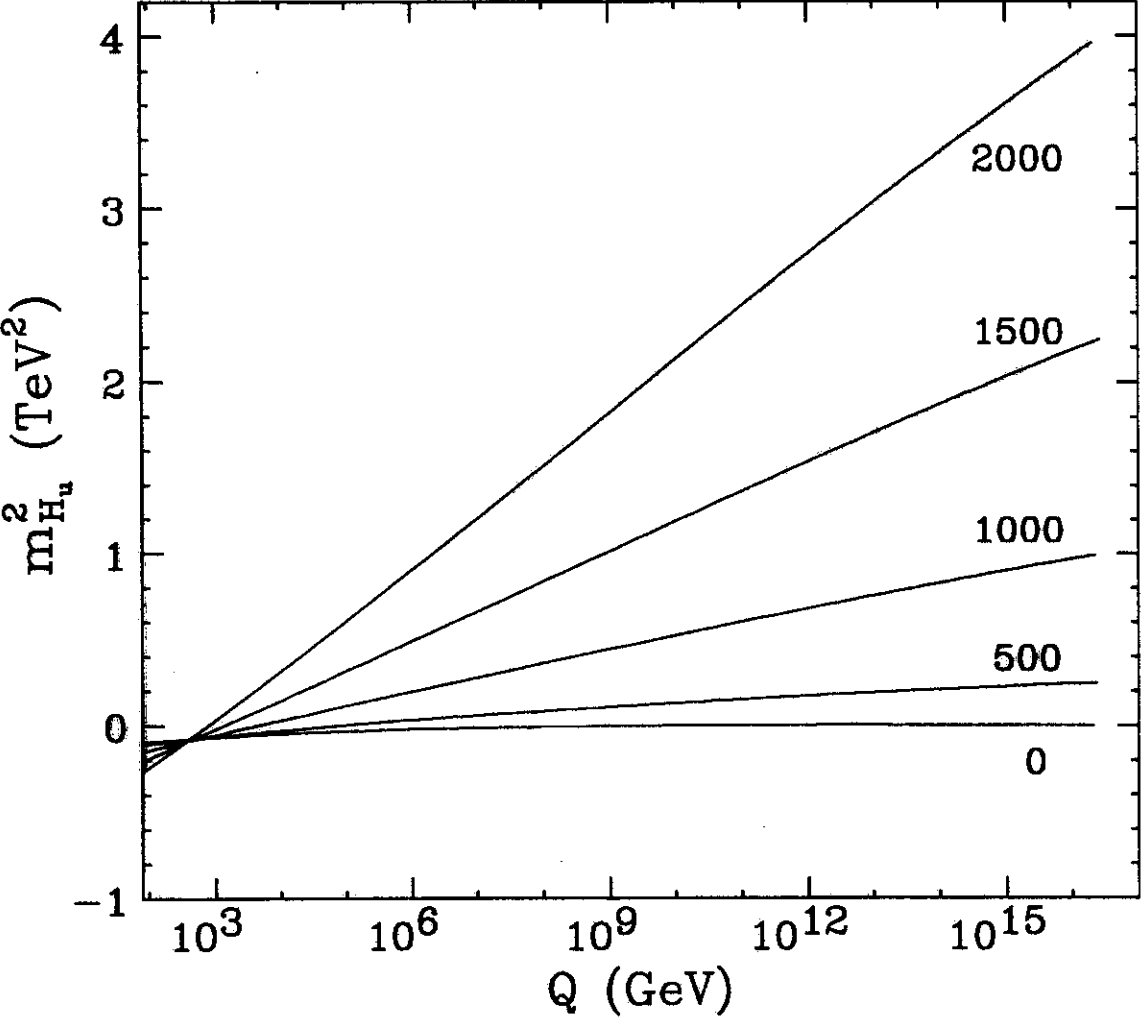
$$10^{-3} \text{ eV} \approx \frac{(\text{TeV})^2}{10^{18} \text{ GeV}} \stackrel{(?)}{\approx} \frac{\Lambda_{\text{susy}}^2}{M_{\text{Pl.}}}$$

$$10^{-3} \text{ eV} \approx e^{-\pi/\alpha_{\text{un.}}} M_{\text{Pl.}}$$

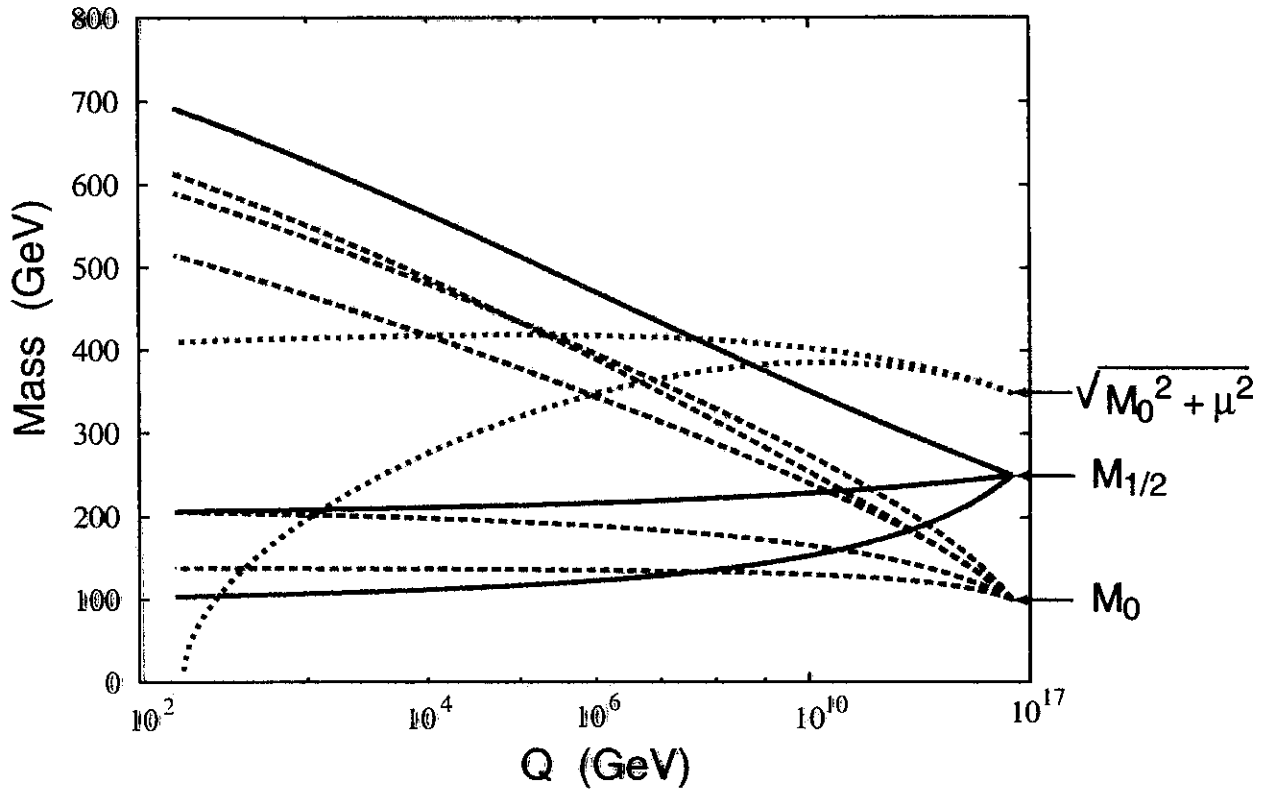




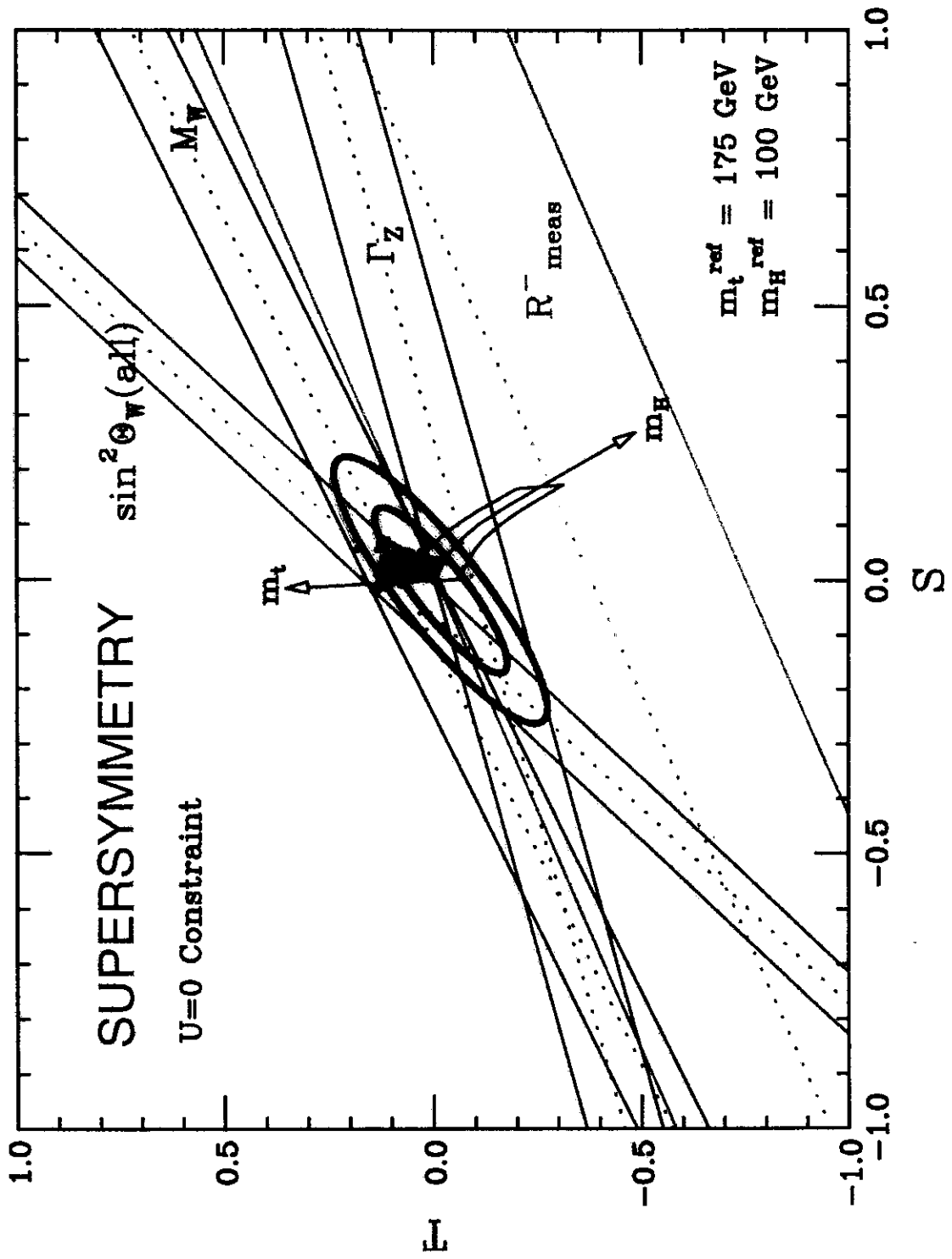
Focus Point

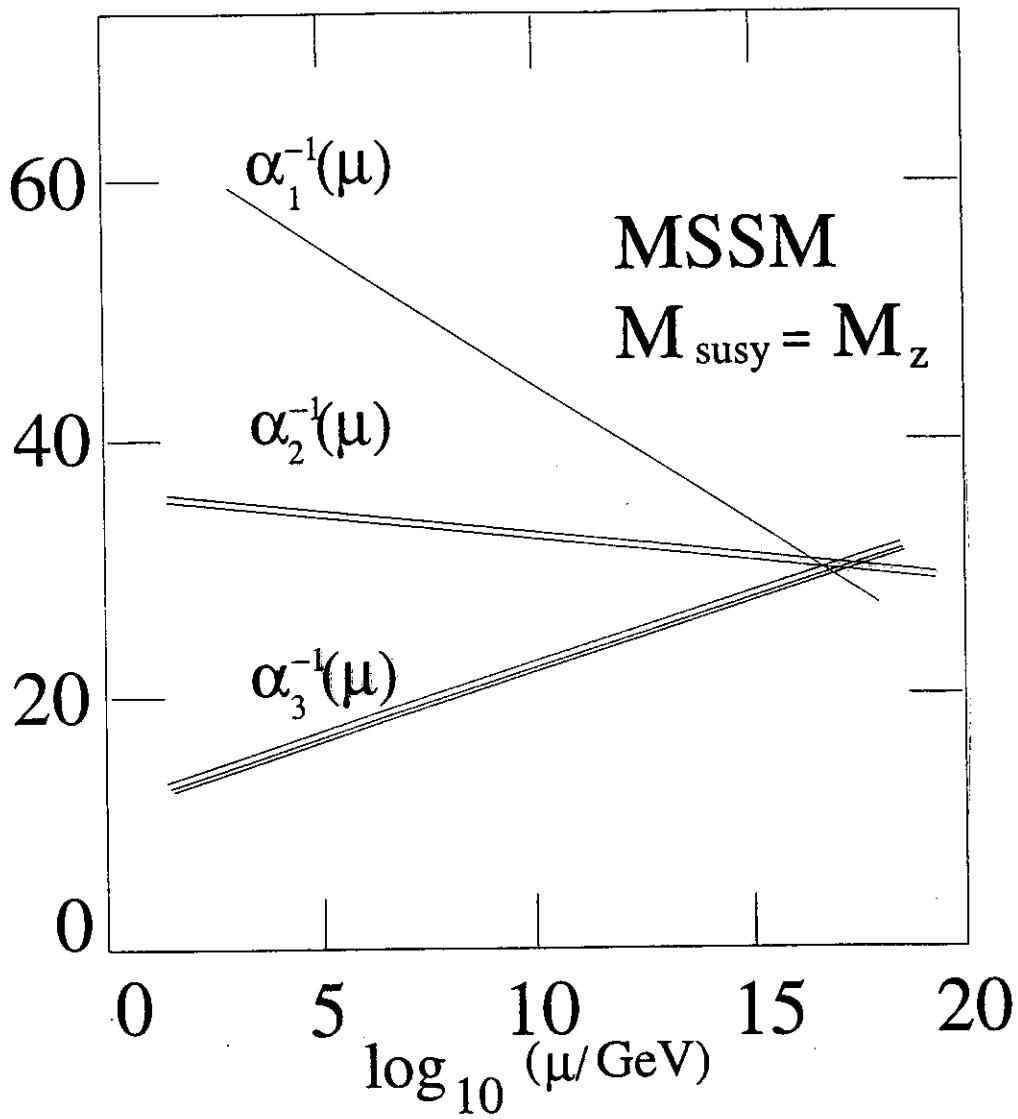


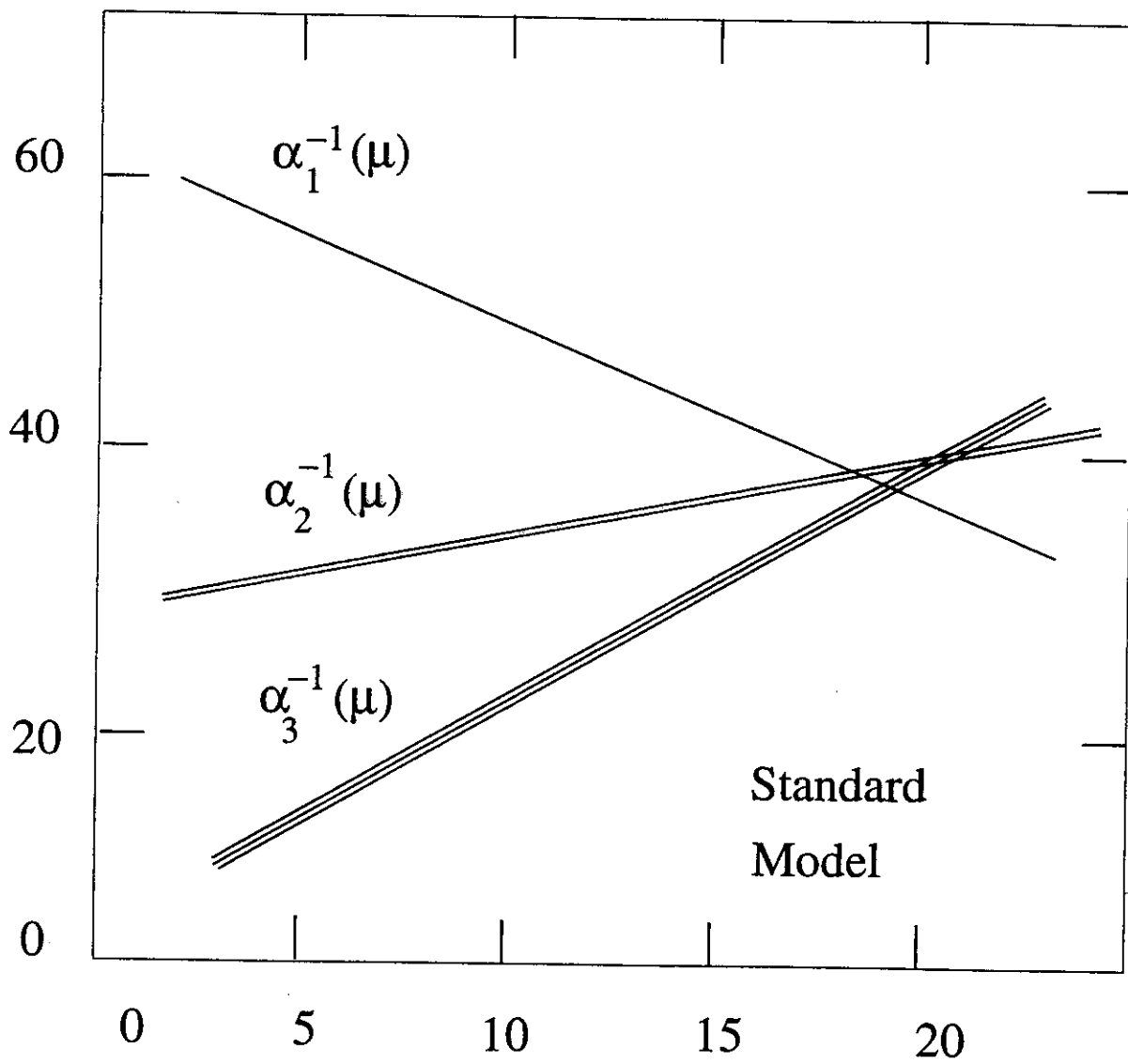
Top Quark



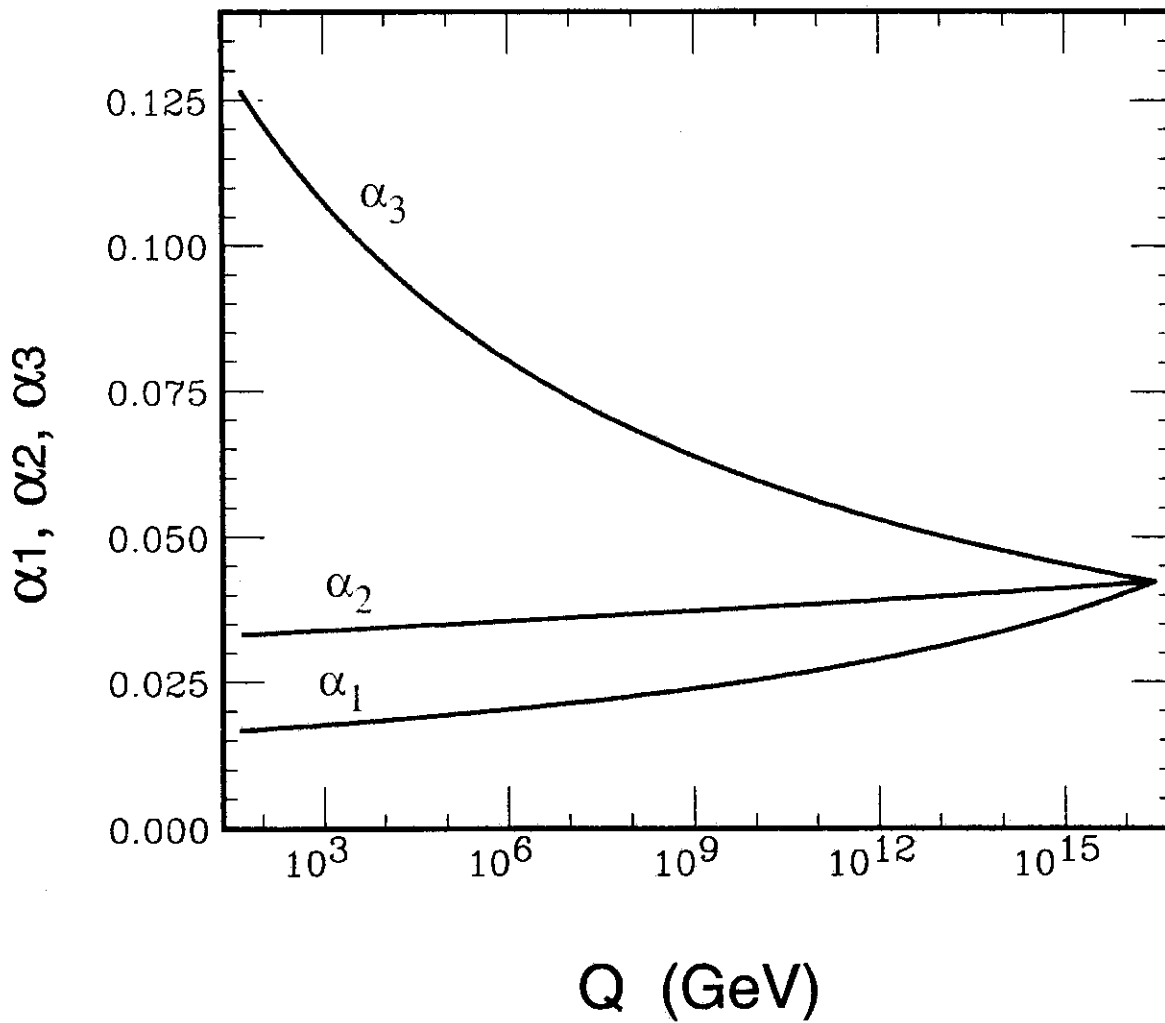
The Higgs mass is driven negative by the large top quark Yukawa.







Gauge Unification



$$\begin{pmatrix} u & u & u \\ d & d & d \end{pmatrix}_{1/6}$$

$$(u^c \ u^c \ u^c)_{-2/3}$$

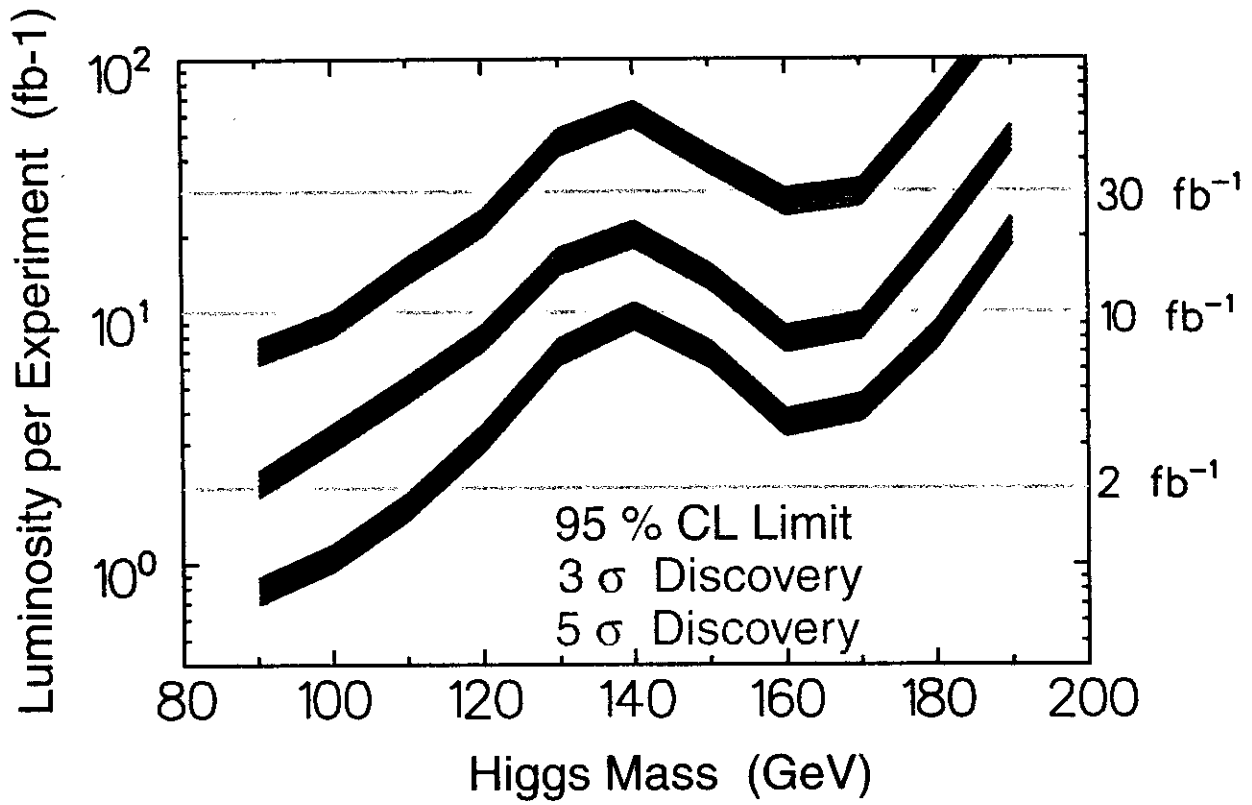
$$(d^c \ d^c \ d^c)_{1/3}$$

$$\begin{pmatrix} \nu \\ e \end{pmatrix}_{-1/2} \quad e^c_{-1}$$

$\textcircled{N} e^c \nu \ d^c \ d^c \ d^c \ e^c \ e^c \ e^c \ d^c \ d^c \ d^c \ u \ u \ u$

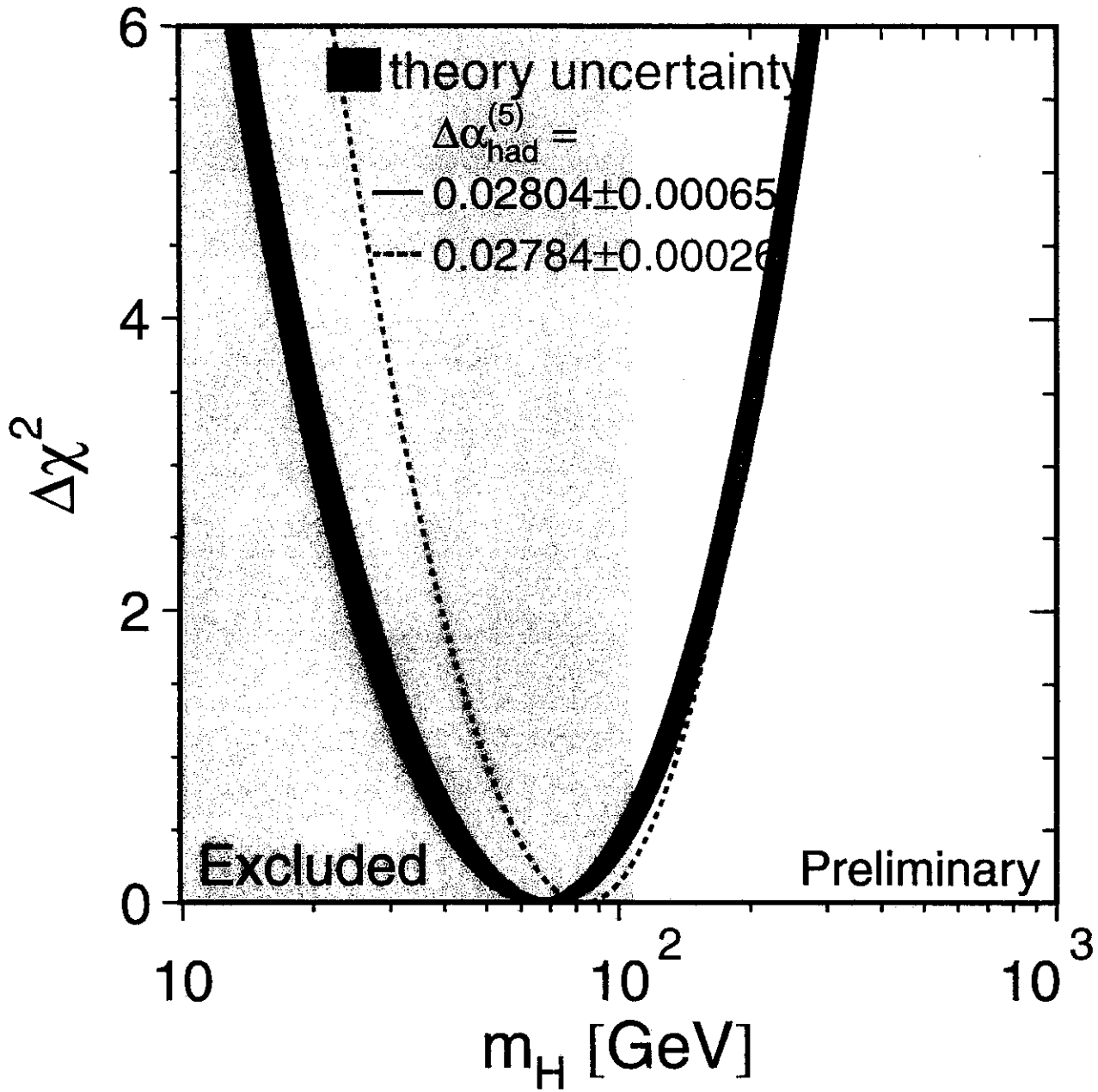
	R	W	B	G	P
1	+	-	-	+	-
1	-	+	-	+	-
1	-	-	+	+	-
1	+	-	-	-	+
1	-	+	-	-	+
1	-	-	+	-	+
1	+	+	+	-	-
1	+	-	+	-	-
1	-	+	+	+	+
1	+	-	+	+	+
1	+	+	-	+	+
1	+	+	+	+	-
1	+	+	+	-	+
1	-	-	-	+	+
1	-	-	-	-	-

$$Y = -\frac{1}{6}(R+W+B) + \frac{1}{4}(G+P)$$



Combined CDF / DØ analysis

Higgs Mass



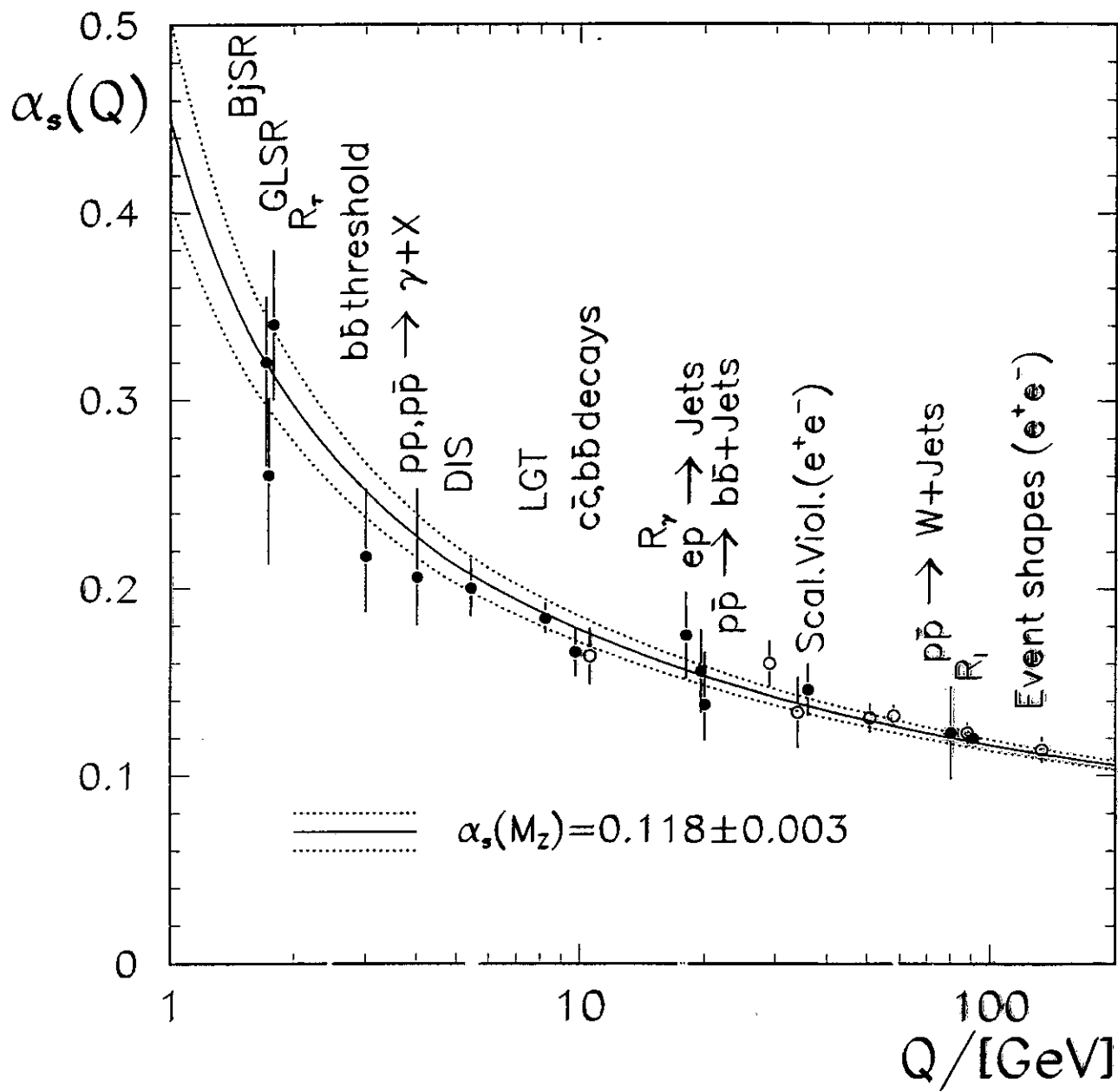
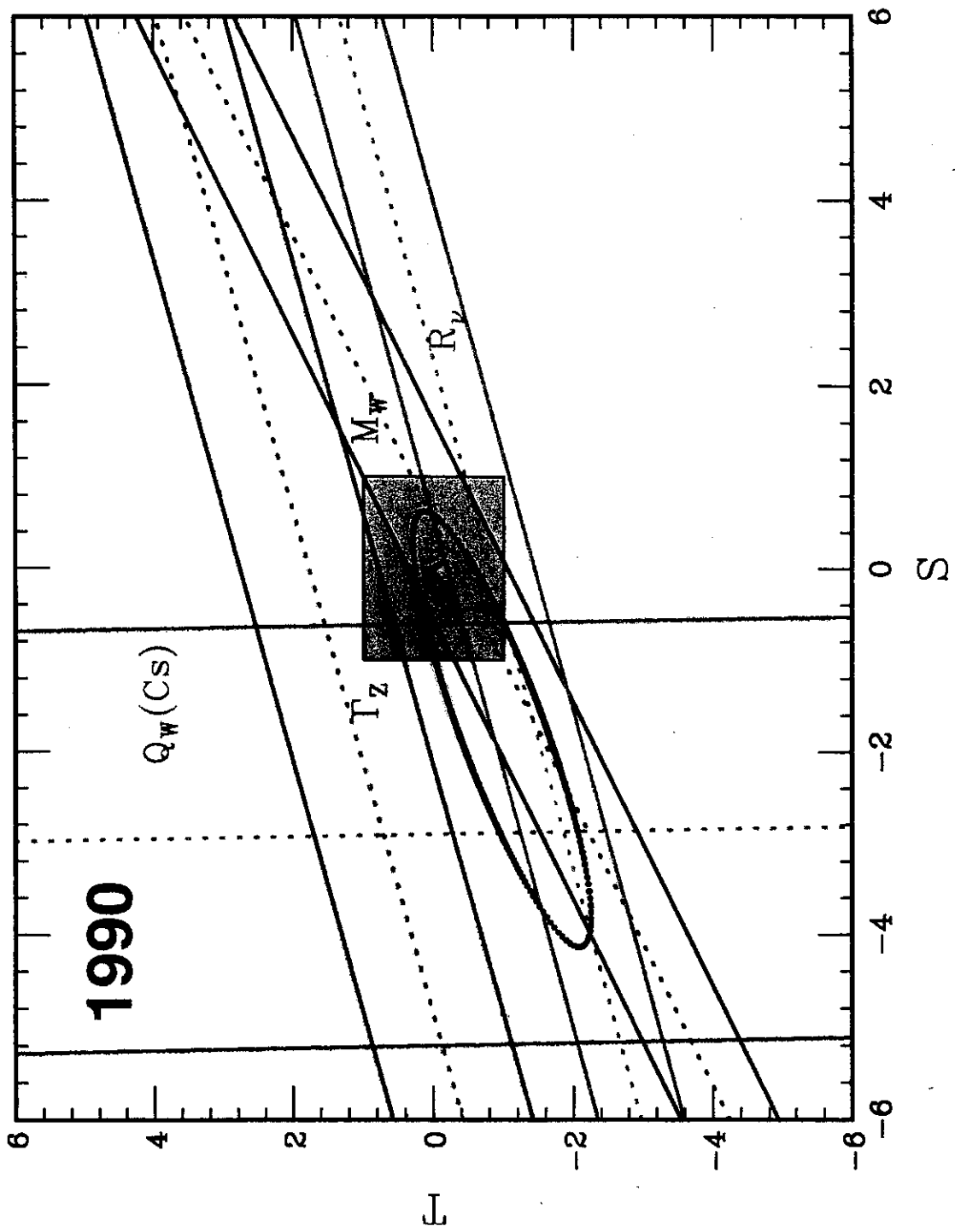
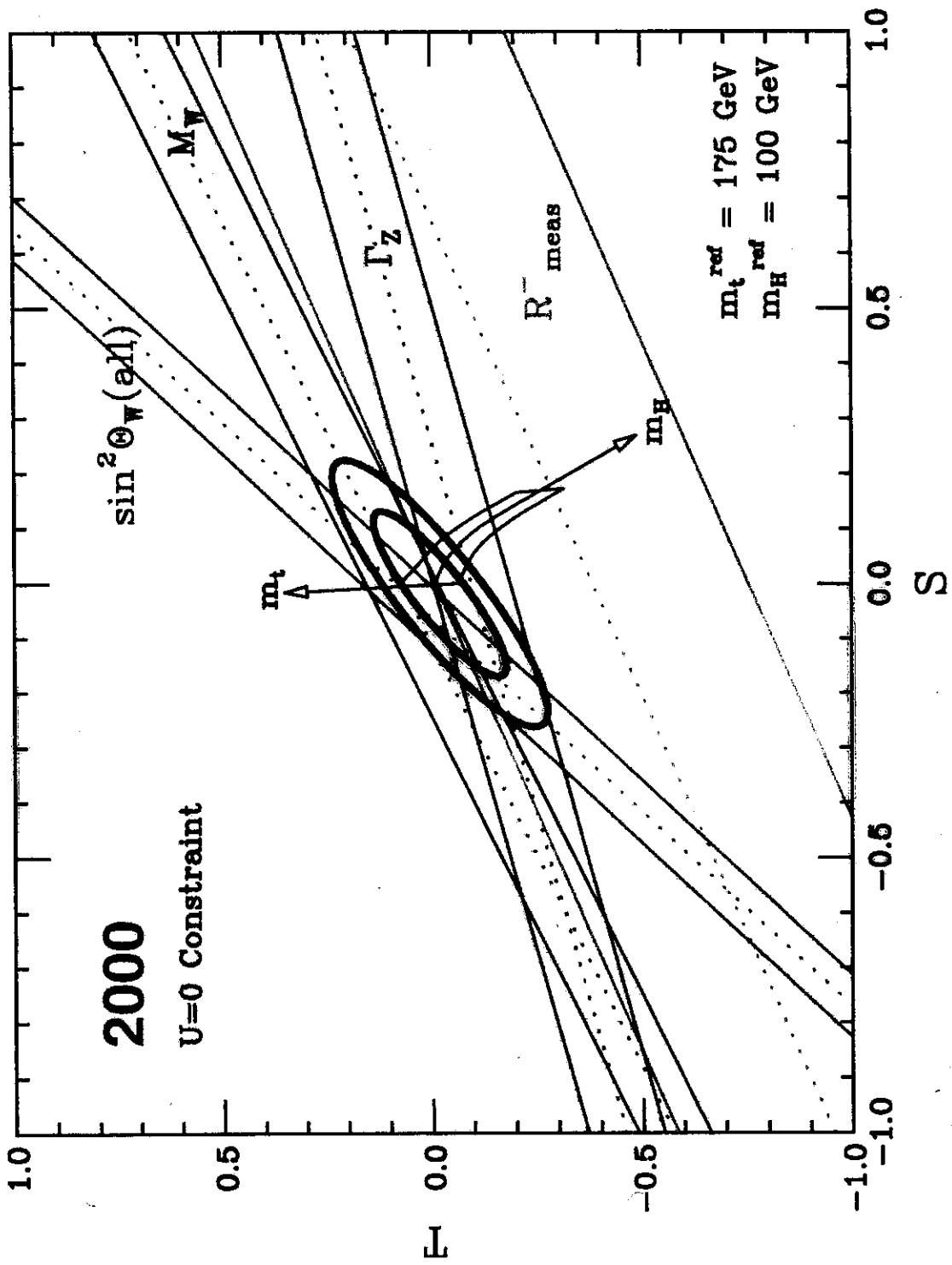
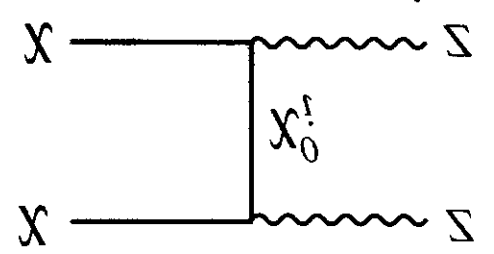
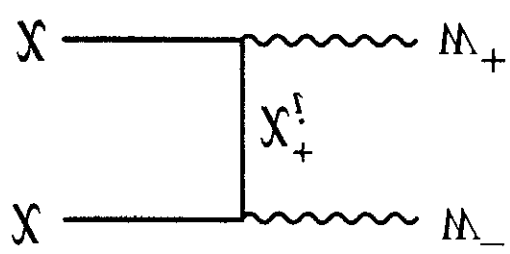
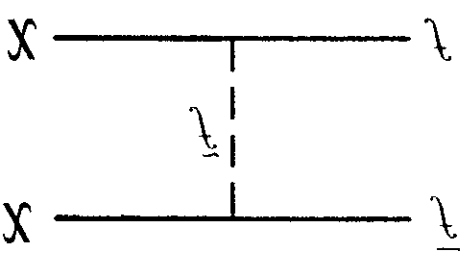


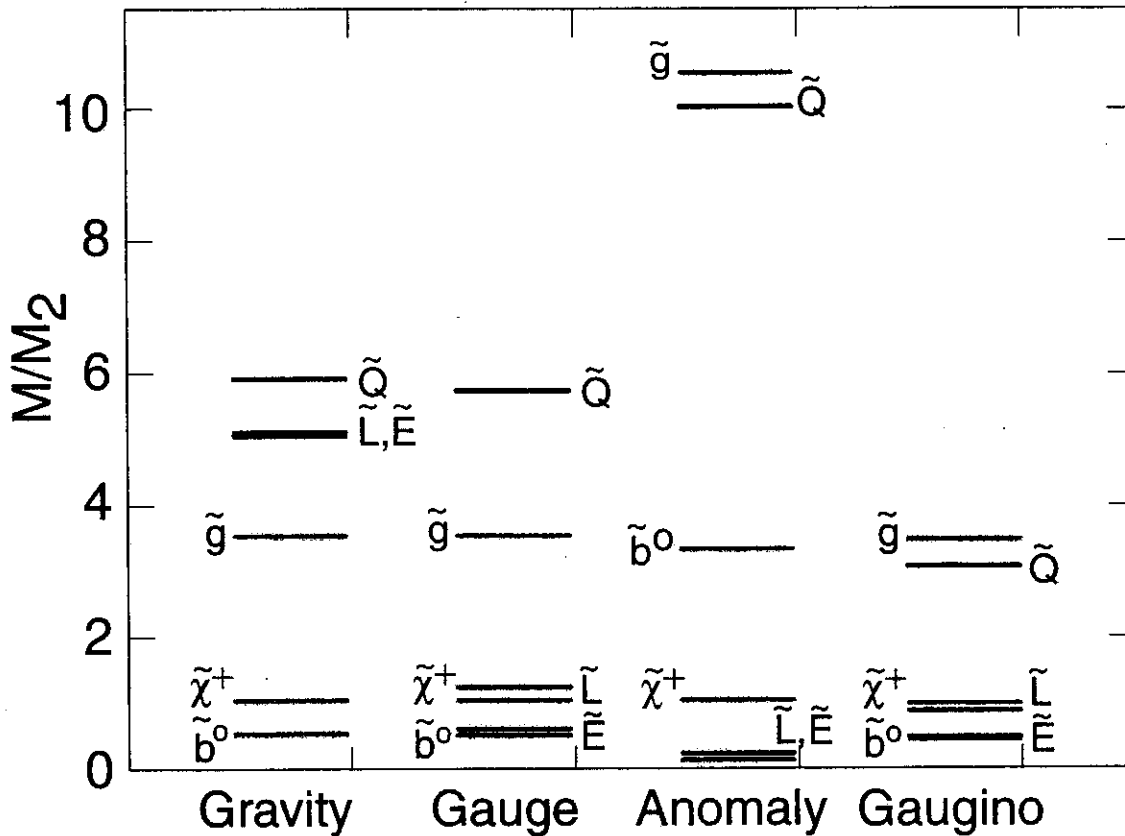
Figure 6: Running of the strong coupling constant established by various types of measurements at different scales, compared to the QCD prediction for $\alpha_s(M_Z) = 0.118 \pm 0.003$. The open dots are results based on global event shape variables.







Sparticle Spectra



Sparticle spectra for various mediation mechanisms.