

Erratum

Production and decay of the Standard Model Higgs boson at LEP200

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There is a typographical error in the expression for $\Gamma(H \rightarrow gg)$ listed in (23): The power of π appearing in the denominator on the right-hand side should be 3 instead of 2. The correct formula may be found, e.g., in (3.40) of [12]. In the computer program that was created for the purpose of this article, this very formula was implemented wrongly, too: There π appeared with the power 5 instead of 3. As a consequence, Figs. 9 and 10 and some entries in Tables 3–5 are erroneous. We thank G. Crosetti for noticing this. Further-

more, the contributions due to the first five quark flavours are neglected in (23), which is an unnecessary simplification and gives an unsatisfactory approximation. We thank P. Janot for pointing this out. (23) should be replaced by the exact one-loop formula, which is listed, e.g., in (3.39) of [12]. We choose to evaluate this formula using the quark pole masses. The revised figures and tables are presented below.

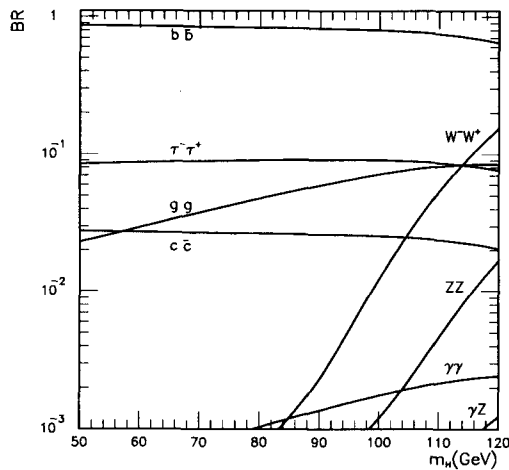


Fig. 9. Branching fractions of the Higgs boson in the m_H window relevant for LEP1 and LEP200. All radiative corrections discussed in the text are included

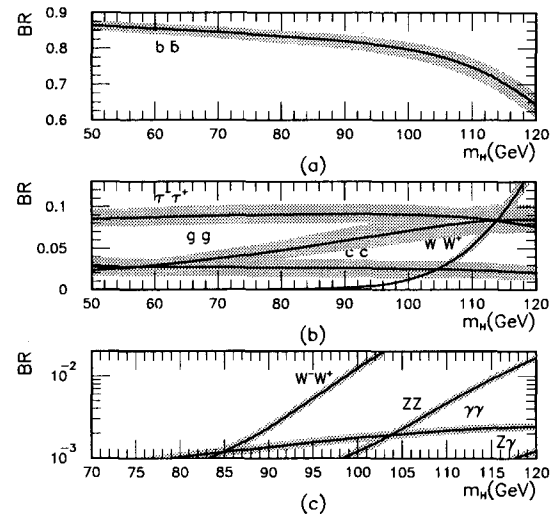


Fig. 10. Branching ratios of the Higgs-boson decays to (a) $b\bar{b}$, (b) $\tau^+\tau^-$, gg , $c\bar{c}$, W^*W^* , (c) $\gamma\gamma$, γZ , and Z^*Z^* versus m_H . The bands indicate the systematic errors

Table 3. Branching fractions (in %) of the Higgs boson in the m_H window relevant for LEP1 and LEP200. All radiative corrections discussed in the text are included

m_H [GeV]	$b\bar{b}$	$\tau^+\tau^-$	$c\bar{c}$	gg	W^*W^*	Z^*Z^*	$\gamma\gamma$
50	86.4	8.5	2.8	2.3	-	-	-
60	85.6	8.7	2.8	2.9	-	-	-
70	84.6	8.9	2.7	3.8	-	-	-
80	83.3	9.0	2.7	4.8	0.1	-	0.1
90	82.0	9.1	2.6	5.9	0.2	-	0.2
100	79.8	9.1	2.5	7.1	1.2	0.1	0.2
110	74.7	8.7	2.5	8.2	5.3	0.5	0.2

Table 4. Branching fractions (in %) of an 80 GeV Higgs boson evaluated from Eq. (12) with M_q and $m_q(m_H)$, respectively, and evaluated including all channels and radiative corrections discussed in the text

Decay Mode	Tree-Level	$m_q \rightarrow m_q(m_H)$	Full
$H \rightarrow b\bar{b}$	87.3	85.5	83.3
$H \rightarrow \tau^+\tau^-$	4.2	11.8	9.0
$H \rightarrow c\bar{c}$	8.5	2.7	2.7
$H \rightarrow gg$	-	-	4.8
$H \rightarrow W^*W^*$	-	-	0.1
$H \rightarrow \gamma\gamma$	-	-	0.1

Table 5. Effects of the uncertainties in M_q and $\alpha_S(m_Z)$ on the various Higgs branching ratios for $m_H = 80.0$ GeV

Decay Mode	BR [%]	$M_b =$ (4.7±0.2) GeV	$M_c =$ (1.45±0.05) GeV	$\alpha_S(m_Z) =$ 0.123±0.006	$M_t =$ (165±35) GeV
$H \rightarrow b\bar{b}$	83.3	+1.4 -1.6	+0.3 -0.3	+0.7 -1.0	+0.1 -0.1
$H \rightarrow c\bar{c}$	2.7	+0.3 -0.2	+0.4 -0.3	+0.9 -1.0	+0.0 -0.0
$H \rightarrow gg$	4.8	+0.5 -0.4	+0.0 -0.0	+1.1 -0.9	+0.0 -0.0
$H \rightarrow \tau^+\tau^-$	9.0	+0.9 -0.8	+0.0 -0.0	+0.8 -0.7	+0.1 -0.1

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