

Erratum to “Revisiting the Global Electroweak Fit of the Standard Model and Beyond with Gfitter”, published in Eur. Phys. J. C60 (2009) 543–583.

The Gfitter Group

Our above-mentioned publication requires changes of citations in the description of the global electroweak fit of the Standard Model and corrections of mistakes in the results of the fit of the two Higgs doublet model (2HDM). We emphasise in particular the use of ZFITTER implementations [1, 2] for the calculation of the partial and total widths of the Z and of the total width of the W boson. The following changes should be made.

Replacement of the sixth sentence in the fourth paragraph in “1 Introduction”. The sentence should be replaced by “The calculations of the partial and total widths of the Z and of the total width of the W boson have been integrated from the ZFITTER package [1, 2] into the Gfitter subpackage GSM and are co-authored by both groups [3].¹ It includes up to two-loop electroweak corrections [1, 2, 4–13] and all known QCD corrections [1, 2, 14].”

Replacement of the first three sentences in “A.3 Electroweak form factors”. The sentences should be replaced by “The electroweak form factors for lepton or quark flavours f , ρ_Z^f and κ_Z^f , absorbing the radiative corrections, are used in the Gfitter software for the calculation of the partial and total widths of the Z boson and of the total width of the W boson. The relevant implementations have been integrated from the ZFITTER package [1, 2] (cf. Footnote 1) and are co-authored by both groups [3]. It includes up to two-loop electroweak corrections [1, 2, 4–13] and all known QCD corrections [1, 2, 14]. In these calculations the intermediate on-shell mass scheme [2] is used, which lies between OMS-I and OMS-II.”

Replacement of the third sentence in “A.4 Radiator Functions” The sentence should be replaced by “The following formulae as implemented in the Gfitter subpackage GSM are taken from [13] and the ZFITTER package [1, 2] (cf. Footnote 1). The relevant implementations are co-authored by both groups [3].”

Correction of R_b^0 constraints. For the theoretical prediction of electroweak precision observable R_b^0 in the 2HDM we used Eqs. (6.3) and (6.4) from Ref. [15]. These equations contained a misprint and the common factors $e/(s_W c_W)$ should be removed. We are grateful to Pietro Slavich and Giuseppe Degrassi for drawing our attention to this. After correction we obtain slightly tighter exclusion regions for R_b^0 as shown in Fig. 1. This figure replaces Fig. 5.1 (top, left) of our publication. The correction will correspondingly affect the combined exclusion regions drawn in Figs. 5.2 of the publication, which is however hardly visible due to the large range in $\tan\beta$ shown in these plots. Since our paper QCD corrections to R_b^0 have been published [16] that will be included in a future update of our analysis.

Typo correction of Eq. (5.3): The correct formula should read

¹Usage and citation of the Gfitter subpackage GSM should include a citation of the ZFITTER package [1, 2].

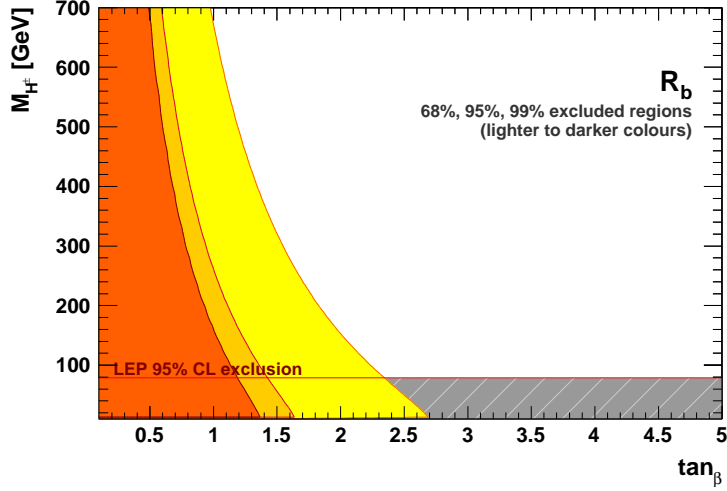


Figure 1: Updated two-sided 68%, 95% and 99% CL 2HDM exclusion regions obtained from R_b^0 .

$$r_H = \left(1 - m_B^2 \frac{\tan^2 \beta}{M_{H^\pm}^2} \right)^2.$$

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