

Correction

Correction: Ferrari, A.; Rompotis, N. Exploration of Extended Higgs Sectors with Run-2 Proton–Proton Collision Data at the LHC. *Symmetry* 2021, 13, 2144

Arnaud Ferrari ^{1,*}  and Nikolaos Rompotis ² 

¹ Department of Physics and Astronomy, Uppsala University, 75120 Uppsala, Sweden

² Department of Physics, University of Liverpool, Liverpool L69 3BX, UK; nikolaos.rompotis@liverpool.ac.uk

* Correspondence: arnaud.ferrari@physics.uu.se

With respect to the original review article [1], the corrected couplings of the Higgs doublets Φ_1 and Φ_2 in the 2HDM type-I, type-II, lepton-specific and flipped scenarios are shown in Table 1. The authors apologize for any inconvenience caused and state that the scientific conclusions are unaffected. The original publication has also been updated.

Table 1. Coupling coefficients of the neutral bosons h , H and A to fermions (top) and vector bosons (bottom). By convention, the Yukawa couplings are the same for up-type quarks (u) and may differ for down-type quarks (d) and charged leptons (ℓ) depending on the 2HDM type for models with built-in flavour conservation. These coefficients ζ are defined such that the Yukawa Lagrangian terms are $-(m_f/v)\bar{f}f\phi$ and $i(m_f/v)\bar{f}\gamma_5 f A$, where $f = u, d, \ell$ and $\phi = h, H$. The coupling coefficients to vector bosons are defined such that the Feynman rule for the coupling ϕVV is given by $2im_V^2\zeta(\phi, VV)g_{\mu\nu}/v$, where $\phi = h, H, A$ and $V = W, Z$. The notations $s_{\beta-\alpha}$, $c_{\beta-\alpha}$ and t_β refer to $\sin(\beta - \alpha)$, $\cos(\beta - \alpha)$ and $\tan \beta$, respectively.



Citation: Ferrari, A.; Rompotis, N. Correction: Ferrari, A.; Rompotis, N. Exploration of Extended Higgs Sectors with Run-2 Proton–Proton Collision Data at the LHC. *Symmetry* 2021, 13, 2144. *Symmetry* 2022, 14, 1546. <https://doi.org/10.3390/sym14081546>

Received: 13 July 2022

Accepted: 20 July 2022

Published: 28 July 2022

Publisher’s Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

| Yukawa Couplings | Type-I | Type-II | Lepton-Specific | Flipped |
|---|---|---|---|---|
| $\zeta(h, u)$ | $s_{\beta-\alpha} + c_{\beta-\alpha}/t_\beta$ | $s_{\beta-\alpha} + c_{\beta-\alpha}/t_\beta$ | $s_{\beta-\alpha} + c_{\beta-\alpha}/t_\beta$ | $s_{\beta-\alpha} + c_{\beta-\alpha}/t_\beta$ |
| $\zeta(h, d)$ | $s_{\beta-\alpha} + c_{\beta-\alpha}/t_\beta$ | $s_{\beta-\alpha} - c_{\beta-\alpha} \cdot t_\beta$ | $s_{\beta-\alpha} + c_{\beta-\alpha}/t_\beta$ | $s_{\beta-\alpha} - c_{\beta-\alpha} \cdot t_\beta$ |
| $\zeta(h, \ell)$ | $s_{\beta-\alpha} + c_{\beta-\alpha}/t_\beta$ | $s_{\beta-\alpha} - c_{\beta-\alpha} \cdot t_\beta$ | $s_{\beta-\alpha} - c_{\beta-\alpha} \cdot t_\beta$ | $s_{\beta-\alpha} + c_{\beta-\alpha}/t_\beta$ |
| $\zeta(H, u)$ | $c_{\beta-\alpha} - s_{\beta-\alpha}/t_\beta$ | $c_{\beta-\alpha} - s_{\beta-\alpha}/t_\beta$ | $c_{\beta-\alpha} - s_{\beta-\alpha}/t_\beta$ | $c_{\beta-\alpha} - s_{\beta-\alpha}/t_\beta$ |
| $\zeta(H, d)$ | $c_{\beta-\alpha} - s_{\beta-\alpha}/t_\beta$ | $c_{\beta-\alpha} + s_{\beta-\alpha} \cdot t_\beta$ | $c_{\beta-\alpha} - s_{\beta-\alpha}/t_\beta$ | $c_{\beta-\alpha} + s_{\beta-\alpha} \cdot t_\beta$ |
| $\zeta(H, \ell)$ | $c_{\beta-\alpha} - s_{\beta-\alpha}/t_\beta$ | $c_{\beta-\alpha} + s_{\beta-\alpha} \cdot t_\beta$ | $c_{\beta-\alpha} + s_{\beta-\alpha} \cdot t_\beta$ | $c_{\beta-\alpha} - s_{\beta-\alpha}/t_\beta$ |
| $\zeta(A, u)$ | $1/t_\beta$ | $1/t_\beta$ | $1/t_\beta$ | $1/t_\beta$ |
| $\zeta(A, d)$ | $-1/t_\beta$ | t_β | $-1/t_\beta$ | t_β |
| $\zeta(A, \ell)$ | $-1/t_\beta$ | t_β | t_β | $-1/t_\beta$ |
| Couplings to Vector Bosons (common to all 2HDM types) | | | | |
| | $\zeta(h, VV)$ | | $s_{\beta-\alpha}$ | |
| | $\zeta(H, VV)$ | | $c_{\beta-\alpha}$ | |
| | $\zeta(A, VV)$ | | 0 | |

Reference

1. Ferrari, A.; Rompotis, N. Exploration of Extended Higgs Sectors with Run-2 Proton-Proton Collision Data at the LHC. *Symmetry* 2021, 13, 2144. [[CrossRef](#)]