

The paper 2510.24658v1 is a submission to the fifth report of the LHC Higgs Working Group (LHC-HWG), to be considered for publication in the journal “SciPost Physics Community Reports”. The authors present several improvements w.r.t. the predictions for the Higgs-boson decays given in the fourth LHC-HWG report. In particular, they extend the applicability of the  $H \rightarrow gg$  calculation in the code `HDECAY` to higher values of the Higgs mass, they compute predictions for the Yukawa-induced decay  $H \rightarrow s\bar{s}$ , and they discuss how the latter can be distinguished from the Dalitz decays  $H \rightarrow s\bar{s} + g/\gamma$ . I find the subject, style and content of 2510.24658v1 appropriate for a working-group report, but some issues must be addressed before the paper can be accepted for publication in SciPost.

- The guidelines of “SciPost Physics Community Reports” specify that the paper must “*contain a detailed abstract and introduction explaining the context of the problem and objectively summarizing the achievements*”. It may be debatable whether the introduction in section 1 meets this criterion, but the one-sentence abstract definitely does not.
- It is not clear from the text of section 2 whether `HDECAY` includes two-loop QCD corrections for all of the quark loops entering the LO prediction for  $H \rightarrow gg$ , or only for the top loop. Eq. (2) of this paper corresponds to eq. (23) of ref. [15], whose results can be applied to both heavy and light quarks. However, the repeated mentions of the heavy-top limit – or HTL, which incidentally is undefined at its first appearance in the text – suggest that eq. (2) refers only to the top contribution (indeed, the caption of figure 1 says that  $\Delta E = 0$  in the HTL). The authors should provide more details on how `HDECAY` treats the bottom and charm contributions to  $H \rightarrow gg$ , especially in view of the fact that the new development described in this section – namely, the extension of the Higgs-mass grid to 3 TeV – necessarily concerns a BSM Higgs boson, whose couplings to quarks may differ significantly from the ones of the SM Higgs boson.

- As a contribution to the fifth LHC-HWG report, 2510.24658v1 has already undergone a public round of review within the working group, as can be seen at the address

<https://cds.cern.ch/record/2939000/comments>

One of the reviewers had asked that, in the right plot of figure 3, the authors show also green and blue curves analogous to the ones shown in the left plot. The authors replied that they “*would like to keep it as it is, since this is still ongoing work so that [they] do not want to show too many details that are not yet cross-checked*”. I find this reply bizarre and rather troubling. It is to be hoped that, in the meantime, the authors have completed all of the necessary cross checks, and are now confident enough in their own results that they can comply with the very reasonable request of that first reviewer. Otherwise, the paper is not yet ready for publication in a journal.

- Another rather troubling aspect of section 4.1 is the fact that the whole text of the section is copied almost word-for-word from section 4.2.3 of ref. [79], a contribution – which I assume to be by the same authors – to the report of a different working group. The figures 2 and 3 also appear to be the same as figures 26 and 27 of that report. Whether this level of self-plagiarism is acceptable in “SciPost Physics Community Reports” is a decision that must be left to the editors.