Response to Report of Referee

We are very grateful to the referee for the pertinent, helpful comments on our manuscript. We have made major revision, and we believe that the paper has been substantially improved according to the referee’s helpful suggestions. We add a whole section (Section IV: Discussion) to respond to the referee’s comments. In the following, we shall respond to the referee’s comments one by one.

1. Referee’s comment: what happens by considering also the Planck polarization and the new tau value 0.055\pm0.009 as found by HFI (https://arxiv.org/abs/1605.02985). In this case the H0 tension is at more than 3 sigma, can be this tension relieved as well? In the HDE+neff+meff the tau constraint is 0.119\pm0.19, so really in tension with the new value. The authors should show what happens in this case.

Our response: We have added two paragraphs in Sec. IV (Pages 5-7; see also Table III): “From Table I, for the constraints without the H0 prior, we notice that the reionization optical depth… … … so actually the tension becomes more severe (in the case of Table II, the H0 tension is at only 0.85 sigma).”

2. Referee’s comment: Is it possible to have the constraints also of w, by adding a derived parameter, and to show it in the triangular plot?

Our response: In the HDE model, w is not a constant, but a time-varying quantity; see Eq. (1) and the discussion below it. Actually, the evolution of w in the HDE model is solely controlled by the parameter c. The parameter c has been constrained; see Tables I-IV, and for the triangular plot see Fig. 4.

3. Referee’s comment: The authors argue that they are not using H0 at the beginning because this is inconsistent with the other datasets. Anyway, by varying DE Planck is really inconsistent with BAO, so this produces a bias in the results. However, Planck TT is inconsistent at about 2 sigma with the lensing reconstruction by Planck (Alens problem). My suggestion is to see what happens by adding a single dataset per time, and to combine only the datasets really in agreement to avoid biased results.

Our response: We have added a paragraph in Sec. IV (Page 7; see the last paragraph of this section and Table IV): “Our calculations are mainly based on the Planck observations. … … … Currently we cannot completely avoid the biases in our global fit analysis.”

4. Referee’s comment: What happens to S8 defined as https://arxiv.org/abs/1606.05338 in this model? Is this tension relieved, or also here they are combining datasets in tension?

Our response: We have added a paragraph in Sec. IV (Page 7): “Next, we discuss the issue of small-scale matter fluctuation amplitude in the… … … and we find that the same conclusion remains.”

5. Referee’s comment: missing reference: https://arxiv.org/abs/hep-ph/0506164 and

https://arxiv.org/abs/1606.06986 for the standard value of Neff.

Our response: We have added these two references; see Refs. [57,58].

We have tried our best to revise the manuscript totally according the referee’s comments. We wish that our revision and response could make the referee satisfactory and warrant the publication in PRD.