

Authors' comment

Before providing our answers to the referees' comments, we need to make the Editor and the referees aware of a change in the manuscript we have decided to introduce because of a new article, which has just been published in Quaternary Science Reviews (Koch et al., 2019). We felt that it is important to mention the finding of that article in our paper because of the possible consequences on the interpretation of the greenhouse gas records. Therefore, we have added a sentence at page 15 line 13-16: *"Rubino et al. (2016) showed that the simultaneous COS increase during the LIA confirms that the LIA CO₂ decline was caused by net terrestrial uptake due to cooling (heterotrophic respiration declining more than Gross Primary Production, due to its higher sensitivity on temperature changes), though a very recent paper estimating the amount of carbon taken up by land use change following the colonisation of the Americas by the Europeans (Koch et al., 2019) provides a different view. Nonetheless, the multi-species approach used by Rubino et al. (2016, e.g. using trends of CO₂, δ¹³C-CO₂ and COS) can provide multiple constraints to help understand the biogeochemical processes behind atmospheric CO₂ variations over the recent past."*, and a sentence at page 17 lines 23-26: *"The emissions from anthropogenic land use change have also been quantified for each world region (Pongratz and Caldeira, 2012, see Fig. 6e), and can be used to subtract the human contribution from the total CO₂ change, even though there is a debate on the amount of land use change following the European colonisation of the Americas (Koch et al., 2019)."*