

In this reviewer's opinion, the manuscript remains in need of much clarification.

The authors did not address my question. I originally asked how the F values calculated using S2007 and L2013 were applied in their simulations. Specifically, S2007 computed instantaneous F values, which could technically be included in every time step to quantify ozone damage to vegetation. L2013-calculated F values, however, depended on CUO obtained from integration "over the growing season" (L231) using Eqs. 5, 6, & 7, meaning that there'd be only one pair of FPO₃ and FCO₃ for their simulation period May – August 2017. So actually, two questions involving L2013: 1. How did they obtain CUO of the growing season for their F value calculations? 2. Was one pair of constant, time-independent FPO₃ and FCO₃ values applied to every time step throughout the simulation period? It was not apparent to me how L2013 was coupled with the land surface model and WRF-Chem all together.

Response: Sorry for the confusion. The CUO accumulates at each time step during the growing season. Both FPO₃ and FCO₃ are calculated based on the CUO by each time step instead of the whole growth season. Therefore, FPO₃ and FCO₃ are different day by day during the growing season. At the end of the growing season, the L2013-based damages are greater than that at the early stage, theoretically. However, the L2013 scheme applies $a_p=0$ for evergreen broadleaf forest, needleleaf forest, deciduous broadleaf forest, and shrubland, $a_c=0$ for evergreen broadleaf forest, deciduous broadleaf forest, shrubland, grassland, and cropland (Table 2), suggesting that these PFTs employ constant F values due to time-independent O₃ sensitivity even if the CUO is varying day to day. In this revision, we clarified that "The leaf-level CUO (mmol m⁻²) is calculated by accumulating stomatal O₃ fluxes of Equation 4 from the start of the growing season to the specific time step." (Lines 227-229)

Reviewer: The authors stated that they used Lombardozzi et al. (2013)'s parameterizations for their study (L209). I am confused from where in Lombardozzi et al. (2013) the authors obtained their a_p , a_c , b_p , and b_c for the 6 vegetation types in their Table 2. In their results from "the exposed to charcoal-filtered air with medium or high confidence in cumulative O₃ uptake (CUO) calculations", Lombardozzi et al. (2013) showed no significance in the linearly regressed equations of photosynthesis in % of control vs. CUO for all plant types except crops and showed no significance in the linearly regressed equations of conductance in % control vs. CUS for all plant types except temperate evergreen trees (L2013's Tables 2&3). In their results from "ambient air" data, Lombardozzi et al. (2013) showed no significance in the linearly regressed equations of photosynthesis in % of control vs. CUO and conductance in % control vs. CUO for all plant types except "temperate deciduous trees" (L2013's Tables B1&B2).

The values the authors used that I recognized, albeit not the ones intended for their purposes in this reviewer's opinion, were 2 orders of magnitude smaller than those in Lombardozzi et al. (2013). This reviewer was taken by surprise by the authors' statement that most of their plant types had "time-independent" sensitivity to CUO since a_c and a_p

values were zero. First, I did not see zero values for a_c and a_p in Lombardozzi et al. (2013); instead, L2013 showed no significance in regression for most plants as stated above. Second, if what the authors stated were true, it'd totally defeat the purpose of that epic study of Lombardozzi et al. (2013)'s. In short, it was very confusing how and where the authors got the values in their Table 2 from.

Further, Lombardozzi et al. (2013) emphasized “chronic ozone exposure” throughout their work, and thus they included the studies that used experimental periods longer than 7 days. That means that the parameterizations derived from L2013 would be only applicable for calculations over periods > 7 days. Hence, the question is: how could the authors' calculations for times shorter than that be valid?

Since S2007 calculated instantaneous effects while L2013 the effect of CUO, it is critical to know what exactly was presented in Figures 2 and 3. The author just stated “O₃ damage”, but they had 3 months simulations. The two figures must be showing post processed values. So, what exactly was shown in those figures? This question points to the comparability of those two figures and consequently their main findings.