This paper is well-organized and makes excellent use of the world's state-of the-art O₃-FACE experiment for rice, representing the first calibration and validation of the JULES-Crop model for rice using such data. As we know, the reliability of any process-based crop model heavily depends on experimental data that closely reflect ecological realism. Compared with controlled environment experiments, FACE experiments better replicate real-world climate conditions, including factors such as leaf temperature, humidity, and air turbulence.

This work significantly enhances the model's ability to simulate rice physiology and quantify yield losses under ozone stress, while also providing calibrated parameters that can be used by other JULES-Crop researchers, and offering a valuable reference for other crop models. It addresses a critical gap in the crop modelling literature and offers important insights for future agricultural research and climate impact assessments.

I recommend publication after the following comments are addressed:

Major comments:

1. P4 L34, Surface downward longwave radiation is calculated based on empirical model instead of reanalysis data, why?
2. P6 L8, Photosynthesis rate can be strongly influenced by ozone. Can you explain the reason why ozone was not considered for the calibration of photosynthesis rate?
3. P17 L13, An explanation of the role of the ozone sensitivity parameters (as listed in Table 5) could be useful. How do these parameters interpret the overall impact of ozone on rice growth?
4. P19, in Figure 13, why the height is around 40 cm, but the stem carbon is near zero?

Minor comments:

1. P2 L21-23, vague statement, it would be better to provide more detail on why flux-based methods demonstrate better performance than concentration-based methods.
2. P14L13 What do key symbols (e.g., κ and λ) in the equations represent and what are their units?
3. P8 L7-10, Vmax doesn't appear to be properly defined. I assume that Vmax refers to the maximum rate of Rubisco carboxylation at 25°C?
4. P10 L1-3, in the model, it is suggested that an upper temperature threshold of 38 °C begins to have a significant impact on the photosynthesis rate, as indicated by fitting the 1:1 line between simulated and observed photosynthesis rates in Figure 4. Can this upper temperature threshold be corroborated by relevant experimental literature?
5. P10 Figure 5 captions need to include brief details on data sources or experimental conditions.
6. P11 L12-13, have those values (i.e. base temperature, optimum temperature and maximum temperature) been calibrated, or are they default settings from the model?
7. P15 L3 Could you add a bit more background on the experimental fields mentioned in Figure 8?
8. P15 L5-6, again, has this leaf senescence rate been calibrated, or is it a default setting from the model?

9. P15L17 Consider providing a brief explanation of how the carbon fraction values were selected from the literature.
10. Ensure that terms like carbon pool, carbon fraction, and carbon content are used consistently.
11. Symbols in Figure 7 and Figure 8 needs captions.
12. Use °C or degree C consistently.