

Answer to Referee # 2

We first thank both reviewers for their thorough comments on our manuscript (MS). We made modifications in accordance with reviewer's comments. **Reviewer's comments in BLACK, authors' reply in BLUE**, and corresponding modifications were made by using track change process in the MS.

Overall Comments:

This manuscript analyzes the temporal variations of the ground-level ozone and ozone profiles measured by ozonesonde in Korean Peninsula. A summer ozone bimodal pattern was found and the effects of the East Asian monsoons on it were assessed. The authors also characterized the temporal variations using satellite measurements and chemical reanalysis products. This study could be a useful reference to understanding the spatiotemporal variation of ozone in the Korean peninsula. In general, I recommend this manuscript for publication after the following comments being addressed.

→ Our MS has been revised, by reflecting the reviewer's suggestions and comments, as bellow.

Specific Comments:

(C1) More details for processing of satellite and chemical reanalysis data should be provided, did the authors consider vertical resolution effects between different data?

→ Thank you for this reviewer's point. In the current study, however, the scope of this paper is to 1) understand the temporal variability of ozone associated with the meteorological variability largely controlled by the summer monsoon over Korean peninsula and 2) to evaluate satellite measurements and chemical reanalysis data for giving an insight on the data selection used to fill in the spatiotemporal gaps of the ACCLIP measurements. In addition, we limited the current study to measurements collected on Pohang station due to the data availability of ozonesondes, because CAMS and Merra2 shows insufficient capabilities of representing the seasonality and long-term variability of ozone; thus the regional chemical model support should be more practical to interpret quantitatively the vertical/temporal ozone variability.

The ACCLIP campaign recently has been launched and carried out during August 2022 to collect airborne measurements over Asian Pacific region, aiming to use in examining the roles of Asian

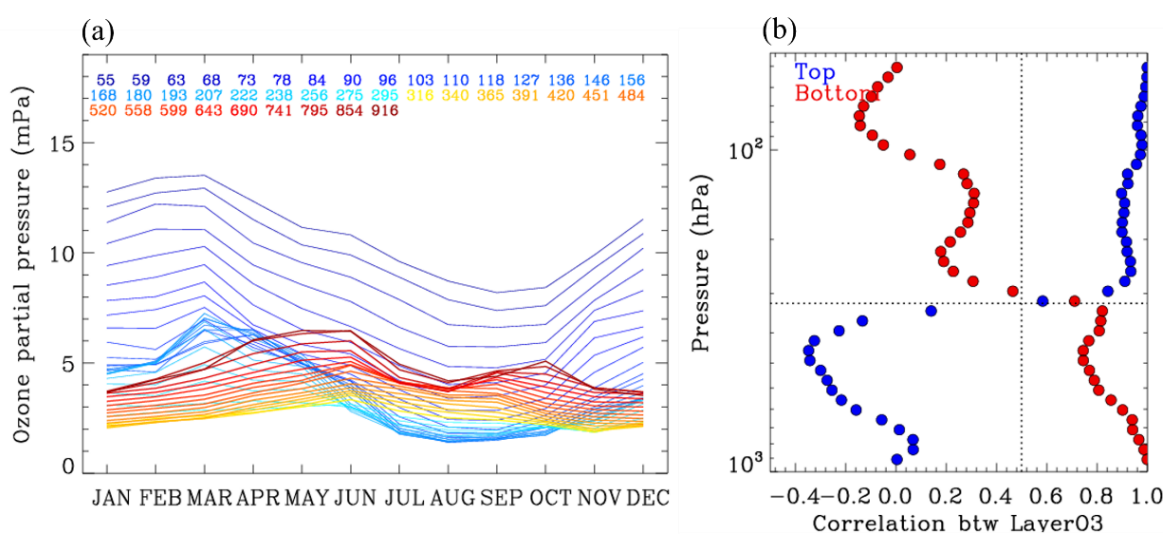
pollution and monsoon strength in chemistry and climate. During the campaign period, ozonesondes have been also launched at 4 sites in S. Korea: Osan, Anmyeondo, and Yongin beside Pohang station during this campaign, and the Korean modelers are simulating the regional chemistry model (including WRF-chem) coupled with WACCM. In this effort, we could provide details of observed relationship between ozone and meteorology from comprehensive, integrated datasets of ACCLIP in the future study. Therefore, in this characterization-correlated analysis study, we do not think that adjusting vertical resolution effects between different data, which is required for quantifying retrieval quality, is needed.

(C2) Part of the OMI data is not available due to row anomaly after 2009, how do the authors deal with these gap?

→ OMI daily coverage has been seriously damaged since 2009 due to row anomaly. However, a specific location could be still sampled within ~ 2 days by OMI. We applied monthly averages to fill up gaps caused by either row anomaly or cloud screening. We do not expect that our application biases to change the major findings of the present study.

(C3) The top legends in Figure 4 are not clear, please change the color of the legends.

→ We replotted Figure 4, as seen below.



(C4) Both “O3” and “ozone” appear in the article, please use one of them throughout the manuscript.

→ Thank you for pointing to this. Throughout the entire MS, “O3” has been denoted as “ozone”.

We appreciate the reviewer’s insightful comments that are believed to have much more strengthened our MS.