Review of Li et al., 2025

In this paper, the authors discuss ozone measurements and trends over East and Southeast Asia. This data was collected as part of the Tropospheric Ozone Assessment Report (TOAR) project and includes surface measurements and vertical profiles of ozone. The authors compute ozone distribution, trends, and exceedances for many regions of Asia which were previously under-sampled. The authors also highlight the role of stratospheric ozone intrusions and the reality of long-term ozone exposure over much of East and Southeast Asia. I believe this paper is scientifically sound and presents actionable results for air quality regulation in the participating countries.

Therefore, I recommend that this paper be accepted with the following **minor** revisions.

Specific Comments:

1) The introduction is very comprehensive about why we should care about tropospheric ozone, and it does a good job summarizing ozone trends over Asia. However, I would like the authors to go into further details about *why* the TOAR database is important. Does it fill data gaps in space and/or time? Is it a convenient new dataset available to the community? This paper was my first exposure to the TOAR project, and I was still left with some of these basic questions. Especially since the intro does such a thorough job explaining ozone trends and the paper continues to split ozone metrics/trends by country, it is unclear to me what value the TOAR dataset adds. Could you comment in the conclusions/discussion as well on what future work could do with the TOAR data? Some ideas which come to my mind that TOAR could be useful for are to analyze ozone trend by lat/lon bins, rural/urban bins, and coastal/inland bins, where political boundaries are less important and some physics questions can be answered.

2) Section 3.1.2: How "new" is the WHO peak season ozone trend? Are there previous studies you can compare to or does the TOAR data allow this to be calculated in a unique way. If this is brand new, highlight this very useful finding!

3) I really like the spatial maps of seasonal ozone concentrations and exceedances. These are very clear and well-explained. At the same time, the paper could benefit from some figures being reorganized or removed. Please see below.

   a. Figure 10: I would recommend moving this to Figure 1 since it is the first figure referenced in the flow of the paper

   b. Figure 3: is this figure necessary? The ozone standards are already mentioned in section 2 and in the supplement S2. I can also see how it be helpful to mention this figure or Figure S2 in section 2 if the authors want to keep this information in the paper visually.

   c. Figure 6 (and other trend figures): There is a lot of information contained in these figures, and it took me a bit to get a handle on what was being shown. I think the following might help to make these figures more digestible: 1) small + and – signs added above the colors, to indicate that blue is decreasing and

red is increasing. 2) increase the size of the arrow legend showing the trend per year. 3) make colored arrows smaller/thinner. These arrows often sit on top of each other and obscure regional variability.

4) Overall, please refer to specific figure panels when appropriate.
5) I would recommend a different title for section 4 that makes it clearer that the paper will be discussing vertical profiles.
6) Lines 428-442: The idea of the ozone climate penalty seems to me to be more in line with "current ozone distributions" or "ozone trends". Maybe consider highlighting the climate penalty earlier in the paper.

Technical Corrections:
Line 146: change "8h average" to "1h average" since you are computing MDA1
Line 160: replace "continued" with "operational" or "ongoing"
Line 161: remove "for utilizing"
Line 174: "regress" should be "regression"
Line 319: change "Figure 10" to "Figure 1" if the figure gets moved
Line 327: change "is used to be strongly intruded" to "is strongly intruding"
Line 398: remove "In a same way"
Line 407: replace "whole" with "to an overall"
Line 411: delete "At surface,"
Line 433: "slop" should be "slope"