

Comments on “Observations of the Lower Atmosphere From 2021 WiscoDISCO Campaign” by Cleary et al. (2021)

Summary/recommendation:

This paper focuses on conducting a field campaign “The 2021 WiscoDISCO” that aims at capturing the elevated ozone concentration events resulting from the lake breeze circulation at Chiwaukee Prairie State Natural Area in Southeastern Wisconsin from May 21-26 2021. To do that, they deployed two Unmanned Aircraft Systems (UAS) platforms at two different altitudes (500 m above AGL for University of Colorado RAAVEN fixed wing UAS and 120 m above AGL for Purdue University DJI multirotor UAS) to measure temperature, humidity, 3D wind and vertical profiles of temperature, humidity and ozone. Moreover, the 2021 WiscoDISCO was conducted concurrently with the Enhanced Ozone Monitoring plan from WI-DNR that included a Doppler lidar wind profiler deployed on the roof of the Chiwaukee Prairie air mentoring station.

The scientific approach is sound and the work presented is substantial. However, the paper deserves more work before publication. I do recommend the publication of the current manuscript in ESSD journal if the authors consider these minor revisions in order to make a nice addition to the literature. I request that the authors consider the following points as they revise this manuscript:

General comments:

1/ The introduction focuses mainly on the goal of the 2021 WiscoDISCO campaign and needs more details to explain the main reason for conducting this campaign and highlight the importance of capturing the breeze impact on local observations by adding more references. Also, authors need to highlight if models capture the lake breeze impact on shoreline ozone observations based on previous studies.

2/ Authors should add a section to explain how Scientists from other fields could benefit from the database created during this campaign. The risk is that the impact of the publication on a broader scientific community remains limited unless the authors put the paper into a wider perspective. Thus, the authors should add a section/paragraph dedicated to a scientific discussion including more references to previous studies to highlight the importance of the collected data (other than determining the breezes impact on local observations during high ozone events) during the 2021 WiscoDISCO campaign.

Specific comments:

1/Page 6 lines 117-119: could authors show the forecast results and add a paragraph to explain how the ideal deployment period for the field campaign was chosen?

2/ Page 7 line 142: What's the saving frequency of the collected data?

3/ Page 10: Section 3 should be prior to the description of measurement location, deployment strategies and sampling.

4/ Page 27 lines 540-551: Authors should think to present these results in a separate section in the paper to demonstrate how the combination of measurements from UAS and Doppler lidar can be useful to characterize the lake breeze incursion. Conclusions should summarize the key supporting ideas you discussed throughout the work presented in the paper.

Technical comments:

1/ Page 2 line 38: please correct "on shoreline" by "on the shoreline".

2/ Page 2 line 63: please correct "night time" by "nighttime".

3/ Page 3 line 68: Please correct "Incorporation" by "The incorporation".

4/ Page 3 line 80: Please correct "up to planetary boundary layer" by "up to the planetary boundary layer".

5/ Page 4 line 104: Please correct "near to the WiDNR" by "near the WiDNR".

6/ Page 6 line 120: Please correct "cancelled" by "canceled".