AQMEII4 Activity 2 Call Notes, 4/4/2023

Attendance: Olivia Clifton, Jesse Bash, Limei Ran, Laurens Ganzeveld, Paul Makar, Colin Lee

ACPD/Egusphere paper online

- Clifton, O. E., Schwede, D., Hogrefe, C., Bash, J. O., Bland, S., Cheung, P., Coyle, M., Emberson, L., Flemming, J., Fredj, E., Galmarini, S., Ganzeveld, L., Gazetas, O., Goded, I., Holmes, C. D., Horváth, L., Huijnen, V., Li, Q., Makar, P. A., Mammarella, I., Manca, G., Munger, J. W., Pérez-Camanyo, J. L., Pleim, J., Ran, L., San Jose, R., Silva, S. J., Staebler, R., Sun, S., Tai, A. P. K., Tas, E., Vesala, T., Weidinger, T., Wu, Z., & Zhang, L. A single-point modeling approach for the intercomparison and evaluation of ozone dry deposition across chemical transport models (Activity 2 of AQMEII4). Submitted to *Atmospheric Chemistry and Physics*. https://doi.org/10.5194/egusphere-2023-465
- Discussion started 3/22; no reviewers yet (5 declined, 2 missed nomination deadline, 2 waiting for response); Joshua Fu is the editor

Olivia filled everyone in about ITM (https://itm2023.vito.be/en) extended abstract for publication in a book by Springer. It's due 4/15, with opportunity for revision after the conference. The extended abstract should contain original work, so be different from the paper submitted to ACP, so she is focusing on Hyytiala and the figures are different. Olivia sent a draft to co-authors and many co-authors have provided comments. Co-authors on the ITM extended abstract are only Olivia, Christian, Donna + Hyytiala PIs + modelers.

Olivia said Anam Khan is working to make the carbon-flux and water-flux based stomatal conductance estimates for the sites. Limei asks that that carbon and water flux data be shared. Olivia says she will talk to Anam – Anam has yet to get all of the latent heat flux and carbon dioxide flux data from the PIs.

→ Post call thoughts -- Need to decide whether we all want to use the same stomatal conductance estimates across the Activity 2 team, or whether groups interested will calculate themselves.

Olivia told everyone that she was asked to give an update on AQMEII4 for the HTAP workshop on April 20. She gave a talk last year as well. She will probably include slides from her AMS talk plus some slides from Christian and Iannis on Activity 1.

Olivia also said she might have an undergraduate intern working with her this summer on Activity 2 work, focusing on diel cycles on nonstomatal deposition. To be determined how much progress is made, but the hope is that eventually we can get this into a publication.

Some discussion as to what we are 'learning' from this effort. Olivia says that between co-author review and submission, she really tried to bring this out in the text, especially in the Conclusions. If people can review this, please do. Nonetheless, the first paper (the one submitted to ACP) is really just a first look, and there is a lot of work to be done.

Paul updated everyone that he thought that there was a discrepancy between the single-point version of GEM-MACH Wesely and what is exactly in GEM-MACH, and so we discussed changing the equations and simulations in the submitted paper. Paul later (post call) found that it was a false alarm.

PSA --- if people are finding errors in equations and/or model simulations, we can still update them in the submitted paper, so please do let Olivia know!

Paul gives a summary of another proposed Activity effort from ECCC that will be led by Kenjiro Toyota at ECCC, they want to review and improve the GEM-MACH dry dep code, and use the single point model setup to do so. Says they might not have a publication in time for the ACP special issue. Paul asks for a list of observationalist folks who need to be asked to be on future papers (given below).

See the ACPD paper for affiliations. Some of them also requested that we acknowledge grant funding in the acknowledgements (you can see the ACPD paper acknowledgements for what you should write).

Harvard Forest
- J. W. (Bill) Munger jwmunger@seas.harvard.edu

Hyytiala
- Ivan Mammarella ivan.mammarella@helsinki.fi
- Timo Vesala timo.vesala@helsinki.fi

Ispra
- Giovanni Manca giovanni.manca@ec.europa.eu
- Ignacio Goded ignacio.goded@ec.europa.eu
- Orestis Gazetas ogazetas@gmail.com

Auchencorth Moss + Easter Bush
- Mhairi Coyle mhairi.coyle@hutton.ac.uk

Bugacpuszta
- László Horváth horvath.laszlo.dr@gmail.com
- Tamás Weidinger weidi@staff.elte.hu

Ramat Hanadiv
- Qian Li li.qian@mail.huji.ac.il
- Erick Fredj fredj@g.jct.ac.il
- Eran Tas eran.tas@mail.huji.ac.il

Borden Forest
- Ralf Staebler Ralf.Staebler@ec.gc.ca
- Zhiyong Wu zhiyong319@gmail.com
- Leiming Zhang Leiming.Zhang@ec.gc.ca

Some discussions as to uncertainty with respect to high values at Borden Forest, high wintertime values at Ispra, and high year-round values at Auchencorth Moss. Olivia says that she added a stronger statement to the ACPD paper about uncertainty in Borden Forest measurements, and added something vague about ambient chemistry contributions to ozone flux at Ispra. Text copied below.

Line 869: *The gradient technique used at Borden Forest is described in Wu et al. (2015, 2016) and was developed for Harvard Forest by comparing gradient and eddy covariance fluxes. Wu et al. (2015) shows that the gradient technique used at Borden Forest strongly overestimates ozone deposition velocities at night and during winter at Harvard Forest, as compared to eddy covariance. Wu et al. (2015) also show that parameter choice can strongly influence deposition velocities inferred from the gradient technique. Thus, seasonal and diel cycle amplitudes as well as the magnitude of observed ozone deposition velocities at Borden Forest are uncertain.*

Line 1603: *In general, high observed v_d during warm months at Borden Forest needs better understanding, given uncertainty in ozone flux measurements from the gradient technique (see discussion in Sect. 3.2).*

Line 1435: *Whether simulated wintertime stomatal, cuticular, soil, and/or lower canopy uptake should be higher at Ispra is uncertain. There may also be fast ambient losses of ozone.*

Laurens says Auke Visser looked at soil NOx contributions at Bosco Fontana – found them to exist but they are small.

Jesse asks if we can have doi for dataset and/or version control, generally wanted a data use statement. Jesse gives the following examples.

- TRY global plant trait database (complex global network).
- https://www.try-db.org/TryWeb/TRY_Data_Release_Notes.pdf

- CrIS data use statement.
- https://hpfx.collab.science.gc.ca/~mas001/satellite_ext/cris/snpp/nh3/v1_6_3/CrIS_NH3_data_usage_statement.pdf

This is what we have in the ACPD paper:

Data Availability

The hourly or half hourly observed ozone flux and forcing datasets are available to individuals wishing to participate in this effort on a password-protected site managed by the U.S. EPA, subject to the individual's agreement that the people who created and maintained the observation datasets are included in publications as the people see fit. Some datasets are already available publicly, and in these cases, we have included the references to the datasets in the text.

Laurens says they are using Amazon ozone flux data – there are really high ozone deposition velocities (2-4 cm/s). Laurens says he can see if they are interested in sharing data for this effort, but likely they will need to publish first. Olivia said that she already asked at the beginning of Activity 2. Before asking again, Olivia says that she would like to make sure someone is interested in leading the effort for that site.