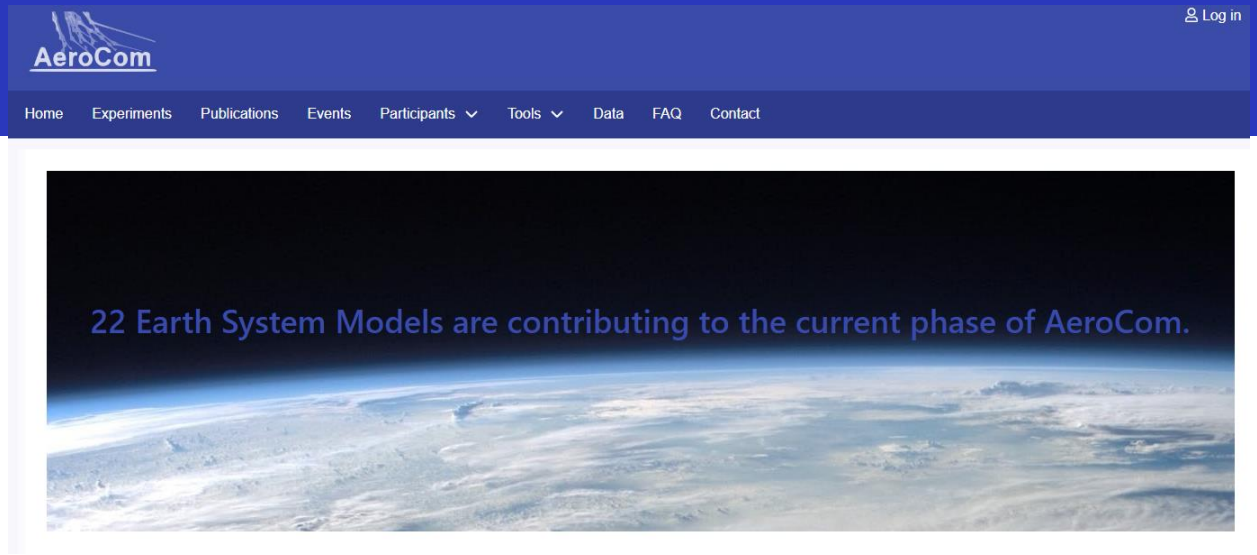
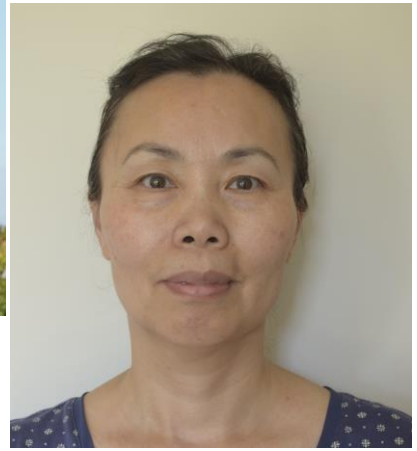


AeroCom Forum, 30th May

- Short presentation of the new AeroCom Scientific Steering Committee
- Short information on the next AeroCom/AeroSat annual meeting
- Discussions on the upcoming AeroCom Phase 4 experiments
    - Four short presentations by Michael, Kostas, Huisheng and Johannes

AeroCom Science Steering Committee

- Yves Balkanski
- Huisheng Bian
- Sara Blichner
- Johannes Muelmenstaedt
- Gunnar Myhre
- Maria Sand
- Michael Schulz
- Nick Schutgens
- Kostas Tsigaridis
- Duncan Watson-Parris







AeroCom SSC roles

• Yves Balkanski	Aerosol properties.
• Huisheng Bian	AeroCom phase 4 (AP4) coordinator.
• Sara Blichner*	Website and data server database.
• Johannes Muelmenstaedt	Aerosol-cloud interactions, AP4 coordinator.
• Gunnar Myhre	AeroCom Forum chair, communication.
• Maria Sand	Website improvement.
• Michael Schulz	Website maintenance, mailing list.
• Nick Schutgens	AeroSat liaison, AeroCom 2024 meeting chair.
• Kostas Tsigaridis	SSC chair, AP4 coordinator.
• Duncan Watson-Parris	Model evaluation.

* Young scientist, a 2-year term position

AeroCom/AeroSAT

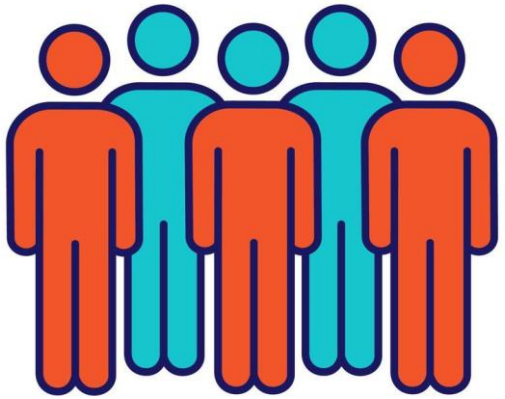
Oct 14-18, 2024 at Lille, France

Paris – 1 hour train
Paris CDG Airport – 1 hour train

Brussels – 35 minutes train
London – 1h20m by Eurostar train

Participants

AeroCom/AeroSAT
Oct 14-18, 2024 at
Lille, France



We account for

October 14 - 16
~ **100 participants** during the first three days of AEROCOM

October 17 - 18
~ **40 participants** of AEROSAT

Dinner October 16
100 participants

Museum visit October 16
60 participants

Venue

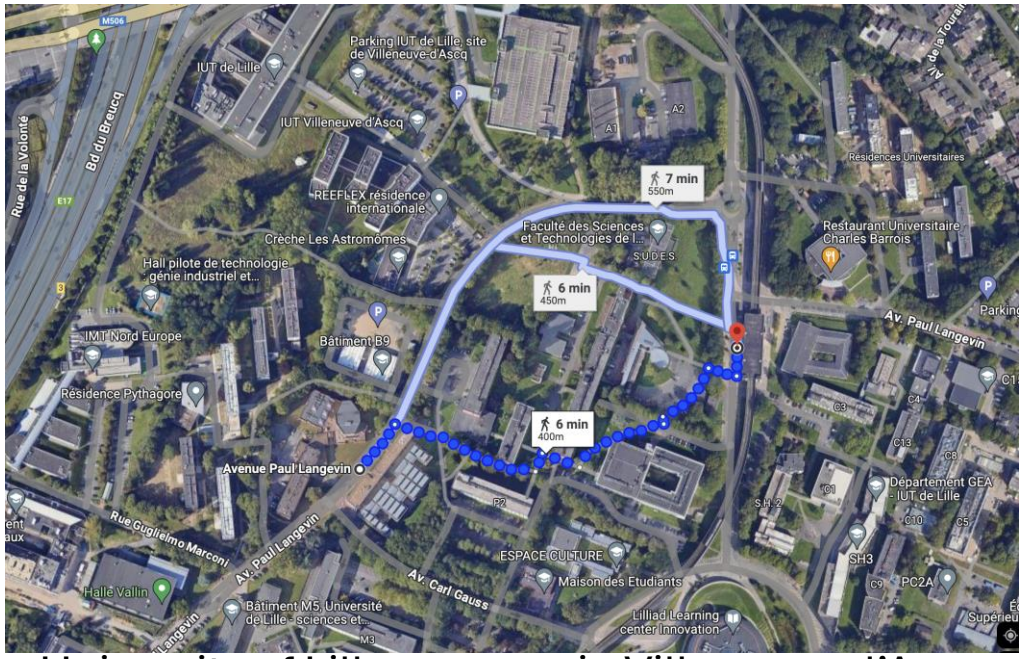
Ascotel/MACCS

The venue is a specialised conference center https://ascotel.fr/en/

- Seminars & Conference center
- Restaurant
- Hotel

Venue

- room capacity 130 persons with presentation facilities
- flat floor, chairs in rows (chairs organisation for AEROSAT)



- on the territory of the University of Lille campus in Villeneuve d'Ascq
- ~ 6 minutes walk from a metro station and ~ 300 m from LOA

The room exits to a hall of 370 m2 where we'll install supports for 30 posters and coffee breaks services.

The Hotel*** will suggest rooms (~30) with a reduced rate (105.00 euro + 1.76 euro taxe, breakfast included)
We will provide a list of other recommended hotels (prices are not negotiated however).

Venue

The Hotel*, of total capacity of 83 rooms,**
rooms (~30) with a reduced rate (105.00 euro + 1.76 euro taxe, breakfast included)

We will also provide a list of other recommended hotels
(prices are not negotiated however).

Venue

Coffee breaks and lunch

Every day we will set up:
- morning welcome coffee with croissants etc (coffee beans machine).
- two coffee breaks with small cookies (at ~10:30 am and ~4 pm)
- lunch on the place in an adjacent restaurant, sited around tables

Ice breaker

Monday on the place (food and drinks).

Banquet

Wednesday (16 October), 7:30 pm

Fairground Museum https://www.museedelafeteforaine.com/

Transportation by bus **15 to 30 minutes**, the place is also accessible by public transportation (~30 min) or taxi within 15 minutes from city centre

The meal (rather in fairground style) served as a buffet (not sited in tables)
All the museum exposition is functioning and will be in free access

Museum visit (?)

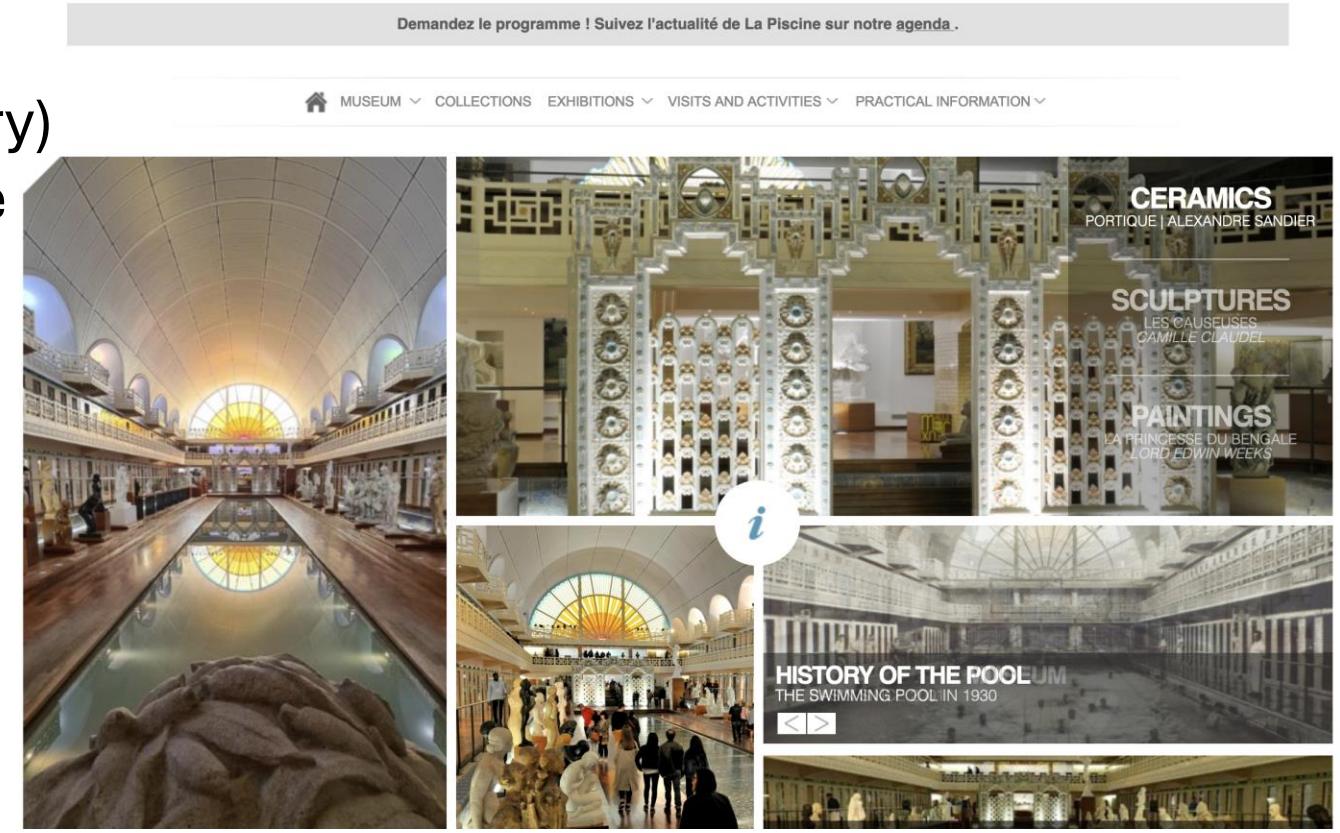
Wednesday (16 October), last entrance possible at 4:45 pm (?)

Lapiscine https://www.roubaix-lapiscine.com/en/home/

- arrival by Metro, ~35 minutes from conference place

- guided visit (focus on local history)
  - 60 people, 3 groups of 20 people

- We can suggest alternatives



Registration fee

3 days or less:	280 euro
More than 3 days:	330 euro
Banquet ticket:	45 euros
Banquet ticket for accompanying person:	55 euros

Sponsors

Local funds are collected, which roughly cover the venue, buses, museum, and major part of banquet expenses

We will need to acknowledge one project (Labex CaPPA), LOA, CNRS, University of Lille, GRASP SAS and probably ESA, CIMEL by putting their logos on the conference website

LOA
LABORATOIRE D'OPTIQUE ATMOSPHÉRIQUE

cnrs Université de Lille

Labex CaPPA

esa

GRASP
In principle, yes!

CIMEL
EXPLORE THE CLIMATE

Aerocom phases I-II-III

Contributing to a suite of papers, IPCC reports

Papers most often mention which phase the simulations belong to
https://aerocom.met.no/publications

Each phase has a protocol for diagnostics
see https://aerocom-classic.met.no/protocol.html

AeroCom user server database has grouped simulation results into “phases”

AEROCOM PHASE I (ca. 2001-2010)
=> IPCC AR4

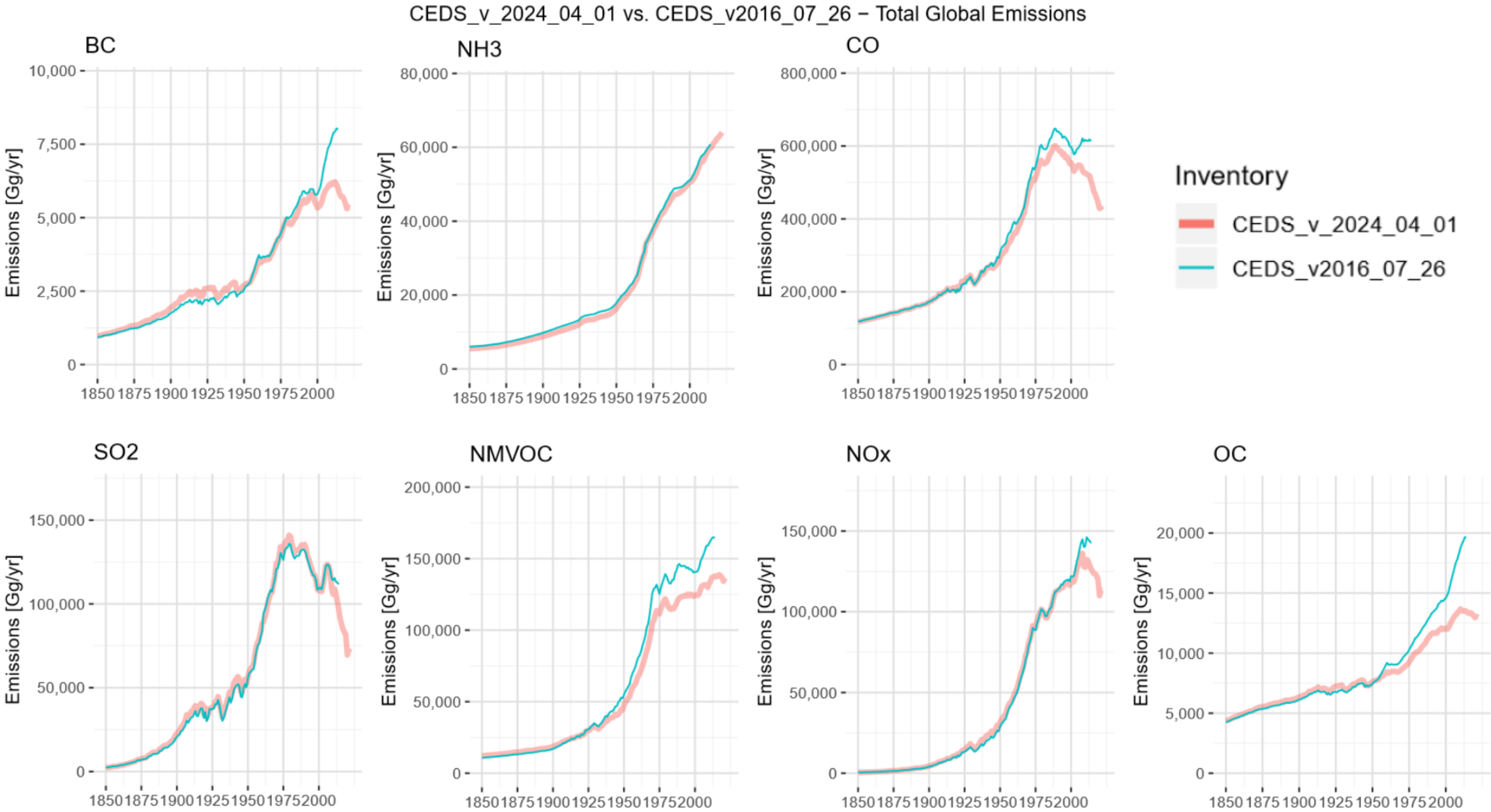
AEROCOM PHASE II (ca. 2010-2017)
=> IPCC AR5

AEROCOM PHASE II I (ca. 2017-2023)
=> IPCC AR6

```
/metno/aerocom-users-database:
total used in directory 1544 available 2763850672128
drwxrwsr-x  32 aerocom  aerocom    4096 May 30 12:21 .
drwxr-xr-x   5 root     root       4096 Dec  5 14:59 ..
drwxrwsr-x  54 jang     aerocom    4096 Oct 22  2015 ACCMIP
drwxrwsr-x  48 jang     aerocom    4096 Aug 19  2016 AEROCOM-PHASE-I
drwxrwsr-x   7 michaels aerocom    4096 Aug 19  2016 AEROCOM-PHASE-I-IND
drwxrwsr-x 193 jang     aerocom   16384 Nov 22  2017 AEROCOM-PHASE-II
drwxrwsr-x  22 michaels aerocom    4096 Aug 19  2016 AEROCOM-PHASE-II-IND2
drwxrwsr-x  46 michaels aerocom    4096 Aug 19  2016 AEROCOM-PHASE-II-IND3
drwxrwsr-x  52 jang     aerocom    4096 Oct 23  2015 AEROCOM-PHASE-II-PRESCRIBED-2013
drwxrwsr-x 165 jang     aerocom   16384 Aug  3  2021 AEROCOM-PHASE-III
drwxrwsr-x 188 jang     aerocom   20480 Aug 31  2023 AEROCOM-PHASE-III-2019
drwxrwsr-x   2 jang     aerocom    4096 Dec  7  2020 AEROCOM-PHASE-III-CTRL2018
drwxr-sr-x   3 michaels aerocom    4096 Mar  1  2017 AEROCOM-PHASE-III-Trend
drwxrwsr-x   2 michaels aerocom    4096 Mar  8 12:58 AEROCOM-PHASE-IV
drwxrwsr-x  12 jang     aerocom    4096 Oct 21  2015 AEROCOM_EMISSIONS
```

AeroCom phase 4 (AP4)

- Why
  - Many new faces in the SSC that bring fresh ideas.
  - It’s been years since the last control experiment.
  - CMIP7 is taking shape.
  - New, and quite different in terms of aerosols, CEDS emissions are imminent.



https://github.com/JGCRI/CEDS/blob/master/documentation/Version_comparison_figures_v_2024_04_01_vs_2016_07_16(CMIP6).pdf

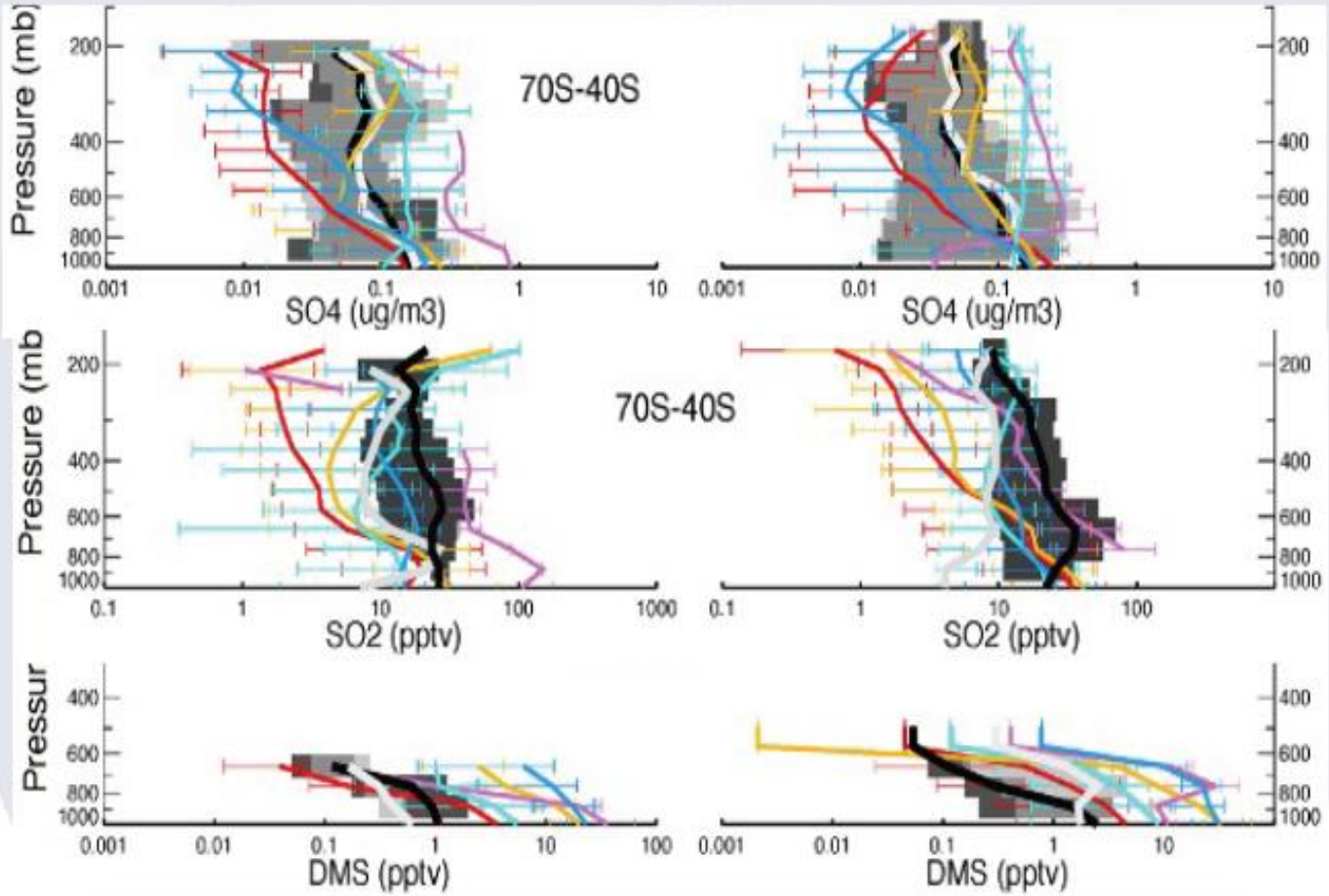
AeroCom phase 4 (AP4)

- Why
  - Many new faces in the SSC that bring fresh ideas.
  - It's been years since the last control experiment.
  - CMIP7 is taking shape.
  - New, and quite different in terms of aerosols, CEDS emissions are imminent.

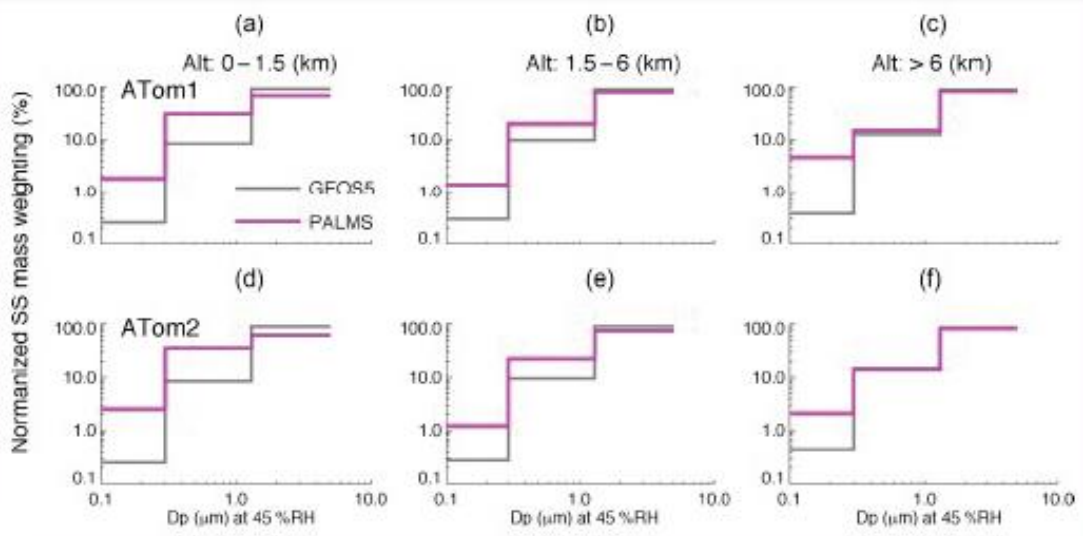
- How
  - Form a protocol for a control experiment that will be able to answer many research questions.
  - Expand on the control with targeted experiments with specific science questions.
  - Revisit aerosol-cloud interactions.
  - Answer *why* models differ, not just *how*.

- Get involved (even if you are not a modeler)
  - https://forms.gle/TGd4sDTpmYwWa7og6

Observationally constrained analysis of **sulfur cycle** in the marine atmosphere with NASA ATom measurements and AeroCom model simulations (Bian et al., 2024)



Observationally constrained analysis of **sea salt** aerosol in the marine atmosphere (Bian et al., 2019)



AeroCom general:

1. Composition =>
2. Distribution => land/ocean, BL/FT/UTLS, interesting regions (e.g., polar, campaign).
3. Process => source origins, horizontal and vertical transport, dry and wet removal, chemistry, …
4. Property => size, optical, …

Improve the models to best represent observations.

Atmospheric New Particle Formation (ATom-NPF), Christina Williamson (the Finnish Meteorological Institute and the University of Helsinki)

What are the sources of new particles in the remote marine boundary layer (MPBL) and free troposphere, how rapidly do they grow to Cloud Condensation Nuclei (CCN)-active sizes, and how well are these processes represented in models?

- In ATom-NPF, the occurrence of NPF and influence of this on CCN number concentrations in the model ensemble will be evaluated and compared with ATom measurements. We will compare the location, number and seasonal dependence of nucleation mode aerosols, Aitken and accumulation mode number concentrations and composition where they can be linked to growth of newly formed particles. The influence of factors such as condensation and coagulation sinks, convective influence, anthropogenic and continental influence and marine influence on new particle formation will be investigated. Hemispheric differences, as well as differences between the Pacific and Atlantic will be examined. Where possible, the influence of different NPF mechanisms (e.g. ion-induced, ternary, organics) within a model will be investigated, as well as the influence of free tropospheric nucleation on boundary layer CCN number concentrations. Systematic differences between modal and section aerosol microphysical models will be examined. Advances in the AeroCom ensemble relating to NPF from those published in Carslaw Mann will be investigated.

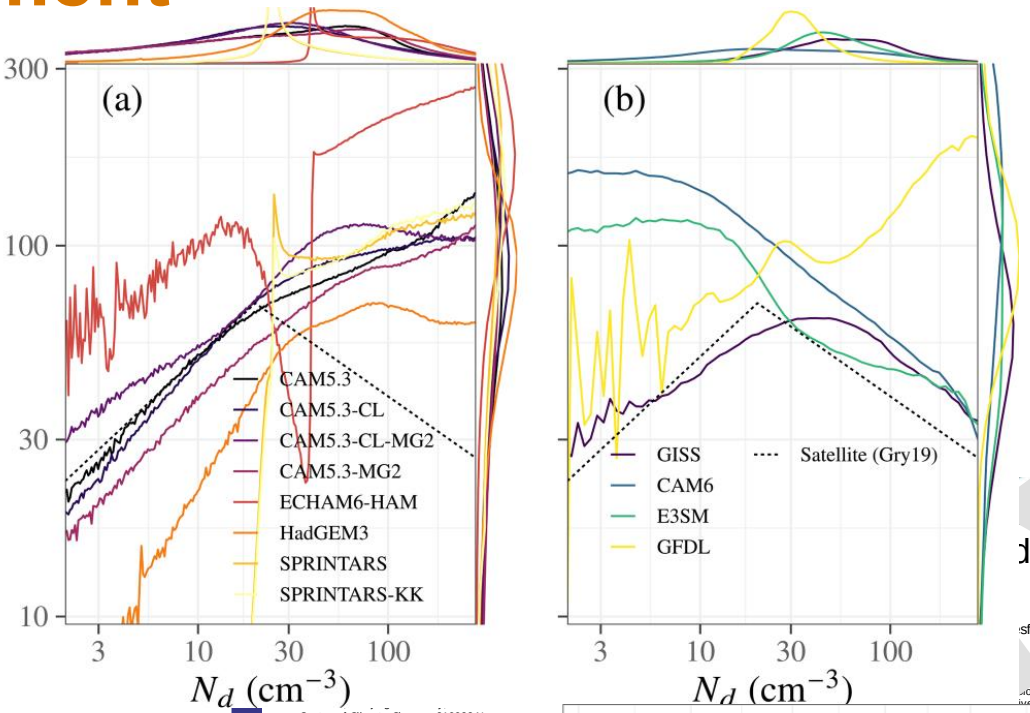
ATom-NPF experiments:

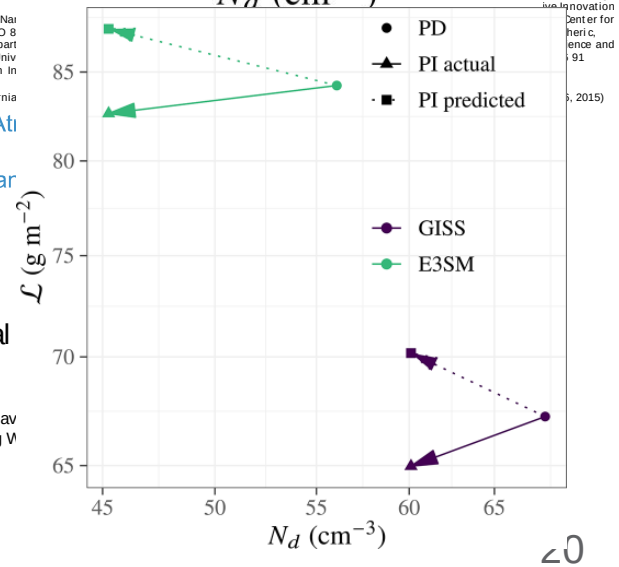
- Base, ExpA,B,C from ATom-general
- ExpNuc - Free tropospheric aerosol nucleation switched off
- ExpSO2 - Anthropogenic SO_2 emissions switched off
- ExpIon, ExpTer, ExpOrg - If your nucleation scheme includes multiple elements (e.g. ion-induced, ternary, organic), switching each of these elements off

Output:
https://docs.google.com/spreadsheets/d/1EaZO6_FEH6nDhWKE9PvUNpfVkU9RdR2ZT6ahLL2VVEo/edit?usp=sharing

ACI "baseline" experiment

- Build on what has worked well
- 5 years high-frequency (3 h), PD and PI emissions
- 2D "cloud-top" fields for moderate space, comparability to passive satellite
- Nudged to PD meteorology for high ratio of ERF signal to internal variability noise
- Qualitative change between CMIP5 and CMIP6-generation models … can we explain why?
- Add extensions for Lagrangian perspective, cloud-controlling factors





Surprising similarities in model and observational radiative forcing estimates

Edward Gryspeerdt[1], Johannes Mülmenstädt[2,a], Andrew Gettelman[3], Florent F. Malav David Neubauer[6], Daniel G. Partridge[4], Philip Stier[7], Toshihiko Takemura[8], Hailong W and Kai Zhang[9]

Atmos. Chem. Phys., 20, 613–623, 2020
https://doi.org/10.5194/acp-20-613-2020
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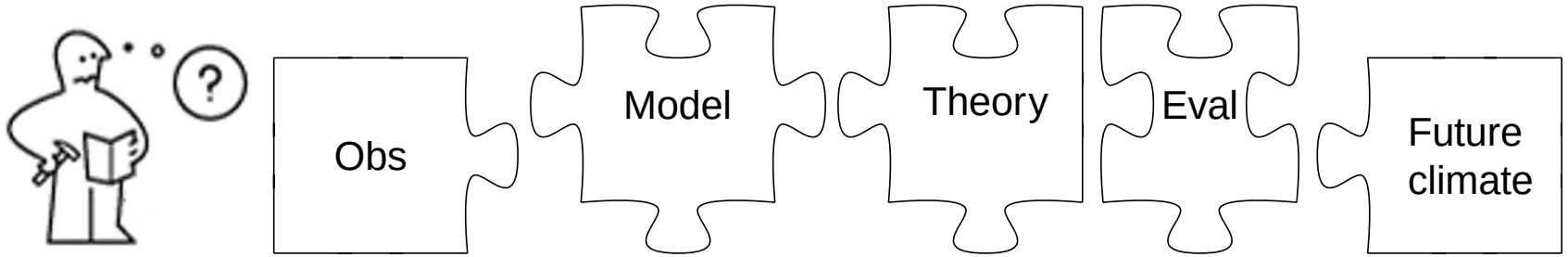
ACI beyond the baseline

- Potential new(-ish) directions:
  - Mixed-phase cloud effects?
  - Perturbed physics ensembles for process understanding?
  - Tighter integration with the ACI process modeling (LES) and ACI observations communities?



AeroCom is community-driven
We are here to facilitate & help
Propose ideas through the questionnaire, AeroCom seminars/meetings, or by talking to SC members: https://aerocom.met.no/