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SOCOL Meetings

SOCOL meeting, 27 September 2022

- Arseniy's PhD? defense planned for 18 Nov
- Freja: SOCOL paper submitted; Gabriel would be interested in Erik's MLO modifications (transient heat fluxes); Freja will try to arrange meeting / knowledge transfer
- Timofei:
 - ◆ successfull CSCS proposal together with Gabriel, starting 1 Oct
 - ◆ SOCOLv4 upgraded with Sandro's solid particle scheme, for soot simulation; Beiping calculates optical properties for SOCOLv4 spectral bands
 - ◆ CCMI-2 paper led by Olaf Morgenstern
- Jessica: Hunga-Tonga simulations with SOCOLv4; starting as nudged simulation, later on free-running for future impacts; Andrea will produce new nudging files as soon as ERA5 data available again
- SPARC GA: Gabriel, Marina, Franziska
- Nora's paper accepted in ACPD
- Tom:
 - ◆ Where is SOCOL currently used? CH, Vienna, Finland (Ksenija: cosmogenic isotopes, radiocarbon)
 - ◆ Collection of all SOCOL-related papers? SOCOL wiki or group webpage?

SOCOL meeting, 13 September 2022

- Andrea: What will happen with data on IAC servers (hydro, ch4) after Tom's retirement (Jan 2023) / end of Gabriel's project?
 - ◆ Storage paid until end of 2022
 - ◆ Gabriel will pay for 2023
 - ◆ Urs will move all data to ETH tape archive as soon as he does not receive any more money; Urs does not provide IAC storage for groups outside of IAC
 - ◆ all users should think about which data they want to keep and where!!!
- Corey: comparison of nudged SOCOL-AER simulations of La Soufriere eruption with aircraft measurements; modelled aerosol profiles seem to be shifted downward compared to obs; suggestions: nudge w/o T, runs with L90 model version
- Hunga-Tonga:
 - ◆ Frank Keutsch wrote white paper to Nasa for new measurements campaign in NZ
 - ◆ Freja did SOCOL-AER runs with H2O? injections from Hunga-Tonga eruption -> ozone impacts?
 - ◆ related articles: 2022 Hunga-Tonga eruption: stratospheric aerosol evolution in a water-rich plume; The Hunga Tonga-Hunga Ha'apai Hydration of the Stratosphere

SOCOL meeting, 05 July 2022

- Timofei: Problems with SOCOLv4 on CSCS after software update (new revision of intel compiler); level of optimization reduced from -O3 to -O; continuous convergence problems in chemistry with SOCOLv4, SOCOL-AER; related to sulfur chemistry? Ari once moved one S-compound (MSA?) from implicit to explicit part (or vice versa?)
- Iga's paper: Gabriel approached Dan Marsh re. WACCM simulation with higher O2 concentrations, but there are no further runs available; they also did not look into stratospheric changes;
- Gabriel: Gordon conference on geoengineering; Sandro presented poster, Gabriel gave short presentation; preliminary results: sulfate aerosol injections lead to NH mid-lats winter warming due to dynamical feedbacks / stratospheric ozone response?

SOCOL meeting, 21 June 2022

- Frank Keutsch approached Tom re. potential collaboration on simulation of Hunga Tonga volcanic eruption with SOCOL
- MLO: Eric used transient MIROC SSTs from 2015-2100 to output transient heatfluxes; these transient heatfluxes then used for transient MLO simulation; how do MLO SSTs compare with MIROC SSTs used for reference run? Any drift? Freja will contact Eric, maybe he will be available for one of the upcoming meetings
- Freja: Further discussion of her results from various volcanic eruption runs; Zanchettin paper
- Timofei:
 - ◆ program for Tom's group retreat?
 - ◆ brief report on Heppa-Solaris workshop last week
 - ◆ will meet with Harald and Iga today to work on Iga's paper, final revisions; Gabriel will approach Dan Marsh re. their paper and whether they have a WACCM simulation with more than 30% O₂, or if they could run such a simulation, to compare the O₃ decline with higher O₂ concentrations

SOCOL meeting, 7 June 2022

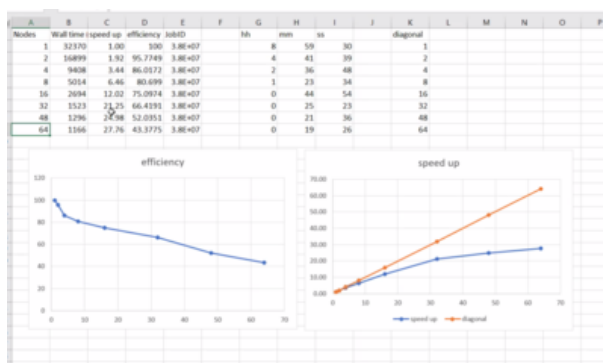
- Freja: presented first results of changes in stratospheric ozone and age of air after volcanic eruptions (5 Tg SO₂) at different latitudes (NH mid-lats, tropics, SH mid-lats); suggestions for further analysis: meridional cross-sections of age of air for individual months instead of vertically averaged age of air changes
- Timofei: experiences increasing problems (instabilities) with SOCOL-AERv2 on different HPC systems; e.g. Finnish model version does not converge on Euler

SOCOL meeting, 24 May 2022

- Yaowei: NASA-ER2 measurements over California in 2021; elevated particles number concentrations about 2 months after volcanic eruption of La Soufriere (13.33N, 61.18W) in April 2021; comparison with CALIPSO measurements suggests spread of volcanic plume towards NH mid-lats;
- Corey: simulations with SOCOL-AER (not nudged) with different SO₂ injections at 16.9 km and 18.5 km at location of La Soufriere; first plots do not show elevated aerosol levels; better look at sulfur mass than particle number concentrations?
- Andrea will prepare ERA5 nudging files for 2021 and early 2022 in T42L39?, T42L90?, T63L47?
- Timofei:
 - ◆ co-author at ISA-MIP paper on Pinatubo, SOCOL-AERv2 data
 - ◆ CSCS HPC proposal submitted together with Gabriel
 - ◆ SNF Synergia proposal on solar flares submitted
- Sandro: output of spectral radiative fluxes from SOCOL-AER for John? Andrea sent respective code from SOCOLv3.1 model version; paper on spectrally resolved radiances in GCMs

SOCOL meeting, 10 May 2022

- Jessica (BOKU Vienna): short presentation on her PhD? project on the importance of interactive ozone on the stratosphere under different GHG and ODS scenarios in WACCM and SOCOL.
- Ksenija (University Oulu): short presentation on her PhD? project on modelling cosmogenic isotopes as ¹⁰Be, ⁷Be, ³⁶Cl, ¹⁴C or ²²Na using SOCOL-AER; first runs do not yet include microphysical treatment of isotopes, i.e. attachment to aerosols and subsequent sedimentation, which might affect results; this process will be considered in the next runs.
- Timofei & Jan: results of scalability tests with SOCOLv4 at CSCS



SOCOL meeting, 26 April 2022

- Another warm welcome to new SOCOL group members: Jessica Kult from BOKU and Kseniia Golubenko from University of Oulu
- Franziska:
 - ◆ Zurich crowd meeting in person again? Do be discussed next time. Finding a seminar room might be a problem
 - ◆ Gitlab for postprocessing scripts and plotting routines? Sandro started a collection on polybox; Franziska put the content on Sandro's gitlab; Andrea invited additional group members to gitlab, but for external users this needs approval by Sandro as repository owner!
- Jan: problems with scalability tests on CSCS: with very high node numbers the ocean model crashes. Any rules for nproca, nprocb, nproma as for atmospheric model???
- Some notes on nproca, nprocb, nproma:
 - ◆ nproma: vector length of calculations in grid point space (default: number of longitudes, at least in ECHAM6)
 - ◆ nproca: gridpoint space domain is divided into 2 times nproca subdomains in north-south directions
 - ◆ nprocb: gridpoint space domain is divided into nprocb subdomains in east-west direction
 - ◆ nlat/nproca ≥ 4 , set nprocb such that $nproca * nprocb = ncpus$
- Timofei: invited as co-author on CCMI-2 paper by Olaf Morgenstern on comparison of models with interactive chemistry and their counterparts w/o interactive chemistry, i.e. SOCOLv4 and MPI-ESM for CMIP6. SOCOL shows very good performance!
- Iga's paper: feedback on new paper draft by end of month; Tatjana recently found a WACCM paper on the same topic => requires probably some adjustments in Iga's paper.
- Next meeting: Jessica and maybe also Kseniia will give a short presentation on their work

SOCOL meeting, 12 April 2022

- Warm welcome to colleagues in Harvard working with SOCOL-AER: Freja, Yaowei, David, Corey
- Andrea will make SOCOL documentation (and wiki pages, if possible) accessible to Harvard colleagues
- Timofei:
 - ◆ recently submitted SNF proposal (collaboration with French group): simulation of volcanic eruptions and solar proton events; French group will analyze ice cores
 - ◆ Finnish HPC project: SOCOL-AERv2 installed, SOCOLv4 to be done; environment similar to CSCS, but slower than CSCS
 - ◆ CSCS deadline mid of May: Timofei and Gabriel intend to submit joint proposal for geoengineering activities
 - ◆ got contacted by Professor (name?) from Fachhochschule Nordostschweiz about regular launches of high altitude balloons, maybe from Davos? Any interested groups in CH?
- Discussion of planned project in Harvard:
 1. Simulation of volcanic eruption La Soufrière in April 2021 with SOCOL-AER (Yaowei, Corey)

- ◊ elevated particle number concentrations measured over Boulder 3-4 months after eruption - could that be of volcanic origin or wild fires? Signal visible in CALIPSO measurements or other satellite data? (Yaowei, Corey)
- ◊ required input data for SOCOL-AER: nudging files based on ERA5; SO₂ emissions, amount, plume height - check data base by Simon Carn
- 2. Organic aerosols in the stratosphere:
 - ◊ Corey: flow tube experiments to measure uptake coefficients, e.g. N₂O₅?
 - ◊ add organic aerosols (level of detail to be discussed) and some kinetics to SOCOL-AER
 - ◊ potentially interesting papers on stratospheric impact of wild fires: Solomon et al., PNAS, 2022; Ansmann et al., ACPD, 2022
- 3. Geoengineering simulations with SOCOL-AER using diamond (David)
- 4. Simulations of volcanic eruptions with SOCOL-AER and MLO (Freja, follow-up of Eric's work)

SOCOL meeting, 29 March 2022

- CCMI-2: deadline for WMO O₃ assessment over; groups are nevertheless asked to upload all simulations that might be useful; PMOD might contribute REF-D2 like simulations with SOCOLv4 from the POLE project; Timofei and Gabriel have to clarify cmorizing of output data
- Geoengineering runs with prescribed forcing from WACCM: several modelling groups need support from Beijing to convert aerosol distribution into optical properties for radiation codes; Tom, Gabriel and Beiping meet on Friday, 1 April
- Gabriel: 2 MSc students from fall semester onwards; CCMI future geoengineering runs and GeoMIP? simulation with SOCOLv4
- SSiRC? meeting in Leeds: Tom will email Timofei and Christina re. abstract submission; Rahel and Sandro will present at Gordon conference
- Storage: additional 80 TB available on ch4:/chemie2; Gabriel will contact Urs to move a couple of folders from /chemie to /chemie2
- SOCOL-AERv2-development on git updated
- Marina & Svenja: ozone recovery runs, 2075 time slice simulation; issues with WACCM: old software stack ifort 15 does not work on multiple nodes anymore; either one Euler VII node or switch of infiniband communication between nodes => substantial slow-down of model performance; other groups use gcc compiler for CESM, but this is also no option for WACCM
- Sandro suggested to invite Harvard colleagues to SOCOL meeting, and asked if it would be possible to set-up public SOCOL-AER website => tremendous amount of work
- Julien Anet (ZHAW) submitted SNF proposal with SOCOLv4

SOCOL meeting, 01 March 2022

- /ch4/chemie again full
 - ◆ users are asked to delete data to make /ch4/chemie operational again
 - ◆ Andrea provided bash script to check for disk usage before automatic data transfer from Euler to ch4
- reasonable queueing times on Euler at the moment
- TEM script: sign error in calculation of EP flux divergence in current version of epf_from_daily? Marina will check EP div climatology
- Timofei:
 - ◆ Franziska making good progress on analysing MP effects on stratosphere; tropospheric effects will be analysed soon
 - ◆ Jessica: PhD? in Vienna, working on chemistry-dynamics coupling in WACCM & SOCOL
 - ◆ Iga: paper revised, schematic of mechanism included; new version will soon be sent out to co-authors

- ◆ greetings from Ari; Ari started looking for a position after his Post-Doc is finished in a year from now, maybe in Spain; if you know anything, let him know

SOCOL meeting, 15 February 2022

- /ch4/chemie full
 - ◆ group will get an extension by 80 TB by end of year
 - ◆ Urs wants to know if we need the additional disk space earlier; if so, how much by when?
 - ◆ estimated storage requirements for Rahel and Sandro until summer (assuming daily output): $100 \text{ runs} \times 15 \text{ years} \times 0.22 \text{ Tb} = 330 \text{ Tb}$, which is clearly too much; changing to monthly means: <40 Tb permanent storage and maybe additional 20 Tb working storage
 - ◆ estimated storage requirements for Svenja and Marina: 80 TB at max, could be reduced to 50 TB

SOCOL meeting, 01 February 2022

- Svenja Seeber started MSc project with Marina and Gabriel on Arctic ozone recovery using SOCOL; welcome Svenja!
- PyNGL?: python "successor" of NCL - <https://www.pyngl.ucar.edu/>
- 7th SPARC GA in October 2022 as multi-hub meeting: website
- ERA5T? for SOCOLv4 simulation of Hunga Tonga eruption: Timofei downloaded data on pressure levels; data on model levels, which are usually used for nudging files, not available via the default scripts.

SOCOL meeting, 18 January 2022

- Timofei new head of climate group at PMOD (Eugene's successor)! Congrats to Timofei and all the best for the new position!
- Iga's paper: Timofei will meet with her on Thursday to finalize the manuscript (hopefully)
- new MSc student in Gabriel's group working with Marina starting in February: Svenja

SOCOL meeting, 08 December 2021

- Last SOCOL meeting before Christmas on 22nd December; new day/time from 18th January onwards: Tuesday, 3 pm, biweekly
- Sandro (lab measurements) and Gabriel (O3 under 4xCO2 in CMIP5) will be presenting at AGU
- Sandro started collection of python scripts for plotting on polybox; please upload example scripts for your most typical plots
- Euler: queueing times seem to be back to normal
- Stratospheric O3 trends over NH polar cap under RCP8.5 in CCMI models and various SOCOL versions: SOCOLv4 close to SOCOLv3 CCMI runs, SOCOL-MPIOM(v3) in 30 hPa on high side compared to other models;
- Timofei:
 - ◆ PhD? in Harald's group working with WACCM on impact of interactive ozone on vortex variability -> collaboration with Gabriel
 - ◆ no news on status of Iga's manuscript

SOCOL meeting, 24 November 2021

- Timofei:
 - ◆ PMOD Synergia on solar flares was rejected, also Julian's proposal on ozone over Davos and Arosa -> will be resubmitted as an Austria-CH joint project
 - ◆ Christina's paper accepted, congrats!

- Euler:
 - ◆ storage situation on /work/climate relaxed again; Sandro, Timofei and Arseniy cleared disk space
 - ◆ currently long queueing times for multi-node jobs; Timofei will observe situation; maybe email Urs to clarify situation as climate shareholder group does not use its share, but nevertheless long waiting times
- Marina & Gabriel: new Msc student from February 2022 onwards; will work on Arctic O3 recovery
- Jan: interesting seminar by Paul Young: no MP -> less O3 -> more UV at surface -> plant damage -> more CO2 in atmosphere

SOCOL meeting, 10 November 2021

- Timofei:
 - ◆ no clear signal of changes in PSC formation in Iga's study: skip this discussion in the paper
 - ◆ Be-paper by Finish colleagues accepted in GMD
 - ◆ planned to put SOCOLv4 code on central repository
- Jan: simulations with CMIP6 solar forcing for Maunder-like minimum; direct and indirect effects on ozone
- Marina: resubmitted her revised paper to Nature
- Eugene:
 - ◆ project with Russian students to investigate SH ozone hole in CCM1-2 simulations; comparison with measurements during nighttime;
 - ◆ EMAC: no ozone hole; SOCOL: overestimates ozone hole, might be related to photolysis at zenith angles > 90deg
 - ◆ Comment by Marina: if polar vortex too much displaced to mid-lats, stronger photolysis at these latitudes could lead to overestimated ozone loss

SOCOL meeting, 27 October 2021

- Arseniy's iodine paper got accepted - congrats!!!
- detailed discussion on Iga's paper and the feedback from co-authors

SOCOL meeting, 13 October 2021

- Iga: sent around revised version of manuscript; feedback until 22 Oct
- recorded conference presentations: Tom suggests to present and discuss one of the existing recorded conference presentations at every SOCOL meeting
- Tom: will give presentation on alumina work in Karen Rosenlof's geoengineering seminar next Thursday, 21 Oct, 17:00 - 18:30 Swiss time; tomorrow (14 Oct), 10:00 preparation meeting with Sandro et al
- CCM1 REF-D2 simulations: no decision yet, Gabriel to discuss with David

SOCOL meeting, 28 September 2021

- New mode for SOCOL meetings suggested: bi-weekly, Wed 1 pm, alternating with group meeting, L17.1 for those who want to meet in presence
- Timofei: CICS project extended for 1 yr
- CCM1 REF-D2 simulation: run new simulations with SOCOLv4 or submit data from existing POLE runs; Timofei and Gabriel will look into possibilities
- SSiRC? workshop: WACCM and EMAC show different effects of volcanic ash on sulfate aerosols; ash modulates SO2 oxidation via heterogeneous reactions; ash leads to warming and lofting; increases sedimentation of sulfate aerosols (coagulation, condensation?); overall effect depends on whether lofting or sedimentation effect dominates; SOCOL-AER w/ solid particles might be adapted for such

SOCOL meeting, 31 August 2021

- SSiRC? meeting end of September: Sandro will submit abstract for 10 min overview on SOCOL-AERv2, Christina's work on small volcanic eruptions and nuc-cond issue
- new time for SOCOL meetings: 3 pm
- Anseniy will host SOCOL meetings for the next 3 weeks while Andrea is on vacation
- Timofei got proofs for SOCOLv4 paper
- Iga close to finish final paper draft
- Marina: her paper got rejected; will prepare letter to editor to rebattle the decision
- Gabriel: discussion of recent Nature paper on future Arctic ozone depletion:
<https://www.nature.com/articles/s41467-021-24089-6>

SOCOL meeting, 17 August 2021

- some organisational stuff on the group retreat
- Tom reported on a new Nature paper on Montreal Protocol impact on global vegetation which is to be published soon; w/o MP more UV would have reached the surface which leads to damages on global fauna => less CO₂ uptake by plants => about 115 to 235 ppmv more CO₂ and additional surface warming by 0.5-1 K globally avg. by 2080-2099; new future runs with SOCOLv4 might include this effect thanks to JSBACH and the carbon cycle: is UV stress on plants included in JSBACH or does the model only calculate fAPAR for photosynthesis
- Jos Lelieveld: no follow-up emails on super nova GCR impact on stratospheric chemistry
- Marina: Questions concerning ODS treatment in SOCOL-MPIOM and boundary conditions for RCP8.5; Andrea sent some documentation on ODS treatment to Marina

SOCOL meeting, 03 August 2021

- Tom invited Tatjana and Jan to the group retreat
- SOCOLv4 paper got accepted - congrats to Timofei!!!
- Arseniy: finally two reviews on his iodine paper available; both appear doable, but require a lot of additional work; Arseniy will set up meeting with co-authors to organise paper revision
- Timofei: decoupling CFCs for radiation and chemistry: problem in read_ghg_3dfile, pbcast(flev); work around: pressure field not read from input file, but hard wired in the code
- Timofei: collaboration with Laura on atmospheric impact of future rocket launches; Laura has MSc student who will work on emission inventories for Cl, H₂O?, NO_x and alumina; Laura asked Timofei to do SOCOL runs, either with SOCOLv4 (no alumina yet) or with Sandro's SOCOL-AER version once it is ready

SOCOL meeting, 27 July 2021

- Andrea: new small bug fix in mo_socol_sun.f90, details see
https://wiki.iac.ethz.ch/Chemie/SOCOLv3BugFixes#Ozone_decoupling_lo3_coupl_FALSE
- Current SOCOL-related papers:
 - ◆ Arseniy: first review on Iodine paper online: asks for more evaluation, seems doable
 - ◆ Marina: three reviews submitted, but still no decision from editor
 - ◆ Sandro: GeoMIP? intercomparison paper in ACPD:
<https://acp.copernicus.org/preprints/acp-2021-569/>
 - ◆ Timofei: GMD-paper on SOCOL-AERv2-BE v1 with the cosmogenic Beryllium-7 isotope cycle rejected: <https://gmd.copernicus.org/preprints/gmd-2021-56/>
- Group retreat:
 - ◆ Timofei intends to come; might present Igaa's and/or Christina's papers as poster

- ♦ Marina/Nora might give tutorial on tropospheric impacts of stratospheric extremes

SOCOL meeting, 20 July 2021

- Timofei uploaded revised version of SOCOLv4 paper
- Eugene: CCMI-2 output approved, file are ok!
- Jan: issues with cdo at CSCS: cdo_intel produces empty fields (zeros) on SH; cdo_gnu works well; user support informed;

SOCOL meeting, 28 June 2021

- CCMI:
 - ♦ REF-D2 with SOCOLv4? New simulation or comorize output of existing simulation? To be discussed with Davos?
 - ♦ Geoengineering runs: WACCM input data now available; Beiping's help needed -> Gabriel and Tom will contact Beiping
- Franziska will resume her PhD? work from 1 July onwards, starting with 10% work load; Timofei takes over technical supervision
- Liang Ran: visiting professor from China, would like to start her 1-yr sabbatical on 1 Nov 2021; potential project: ozone changes over the Tibetan plateau, comparison SOCOL output vs. observations
- Iga: updated paper draft available on Google Docs

SOCOL meeting, 21 June 2021

- discussion of Christina's paper draft and open issues

SOCOL meeting, 15 June 2021

- SOCOLv4 paper: Timofei will finalize and upload authors' response; Fig. 3b to be excluded and new figure with ENSO FFT and PDF to be added
- SOCOL-AER cond-nuc issue: strong impact of microphysical order on ozone; outside of polar regions most likely due to increased N₂O₅? hydrolysis (increased SAD) and therefore reduced O₃ depletion by NO_x cycle; detailed effects still to be figured out; as soon as we agreed on a new moel configuration, Timofei will repeat the ISA-MIP runs.
- Storage on hydro: /chemie is (again) almost full; Gabriel will ask Urs to increase ch4:/chemie by 50 TB; all SOCOLists are asked to remove data on hydro:/chemie; Andrea will ask Ari and Michael Steiner, Eugene will get in contact with Pavle

SOCOL meeting, 08 June 2021

- from next week onwards (15 June) the SOCOL meeting will start at 11:00 am
- Tom: Jos Lelieveld asked for cooperation on super nova GCR impact on stratospheric chemistry; model simlations with SOCOL to provide OH and NO_x perturbations: SOCOLv3 includes only parameterisations, full ion chemistry only implemented in SOCOLv2, large effort required to implement ion chemistry into SOCOLv3; not sure what Jos had in mind; Tom will contact Jos to arrange a meeting to discuss open qustions and potential collaboration
- Timofei: working on SOCOLv4 paper reviews; main comment on ENSO variability in SOCOLv4, other comments only minor; Timofei intends to submit replies by end of week
- Timofei: advertised early carrer post-doc grants available in Austria
- Christina's volcano paper: Co-authors, do not forget to provide feedback asap!!!

SOCOL meeting, 01 June 2021

- QOS 2021: deadline for abstract submission extended until 14 June 2021; Marina already submitted an abstract; Arseniy and Tatjana plan to submit an abstract, Timofei wants Iga to submit an abstract as well
- SOCOLv4 paper: open discussion closed; two positive reviews with minor revisions available so far
- Timofei: submitted today a big synergia proposal with Louise about solar flares and their terrestrial impacts
- CCMI: Eugene uploaded all data to CEDa, 3 ensemble members REF-D1, 1960-2018; REF-D2 will not be done, too expensive; limited output from previous SOCOLv4 simulation with coupled ocean available; someone would have to cmorize the output...
- C2SM?: technical contact person for Tom's group? Does anybody need access to C2SM? git-hub?

SOCOL meeting, 27 April 2021

- nucleation/condensation issue in SOCOL-AER:
 - ◆ Andrea: nucleation/condensation order and microphysical time step has only minor impact on tropospheric burdens and wet deposition (background case)
 - ◆ Timofei: Pinatubo simulation with changed order of nucleation and condensation => smaller initial peak in strat. burden, slower decay, longer lifetime; smaller effective radius during peak; r_eff peaks only later; once the final microphysical time-step / order has been defined, Timofei will reproduce ISA-MIP simulations
 - ◆ Sandro: test simulations with new sub-timestepping for nucleation/condensation; turned out that coagulation seems to be the crucial process; will do further test without additional sub-time steps, but reversed order and overall slightly decreased microphysical time step (na = 30-40 instead of 20) to keep computational effort reasonable
- Euler: according the Euler support it is not possible to run code compiled with `parallel_studio_xe/2018.1i` in Euler VI as this version is optimized for Intel CPUs and should not work on AMD processors, although there are rumors that Urs uses this compiler version also on Euler VI...; Timofei will try to compile SOCOLv4 with gcc...
- CCMI-2: Eugene still waiting for approval of cmorized output to upload the data onto archive; no replies from CEDa; call for REF-D2 (1960-2100, coupled ocean if possible) has been sent around; proposed deadline for data submission: August 2021; question: where to run the model simulations? Euler too slow; CSCS not enough computing time
- Iga: plans to submit her paper to Nature communications first, npj (nature partner journals) climate and atmospheric science might be second choice; all co-authors are asked to work on manuscript!!!
- Andrea will be on vacation in May; Gabriel will host the next meeting and then hand over to someone else

SOCOL meeting, 20 April 2021

- CCMI-2: Eugene still waiting for approval of cmorized output to upload the data onto archive; no replies from CEDa or David
- Timofei: running sensitivity simulation for Pinatubo with switched nucleation / condensation order
- Timofei: SOCOLv4 compiles with `parallel_studio_xe/2018.1i`, but does not run, because certain shared libs cannot be loaded
- Iga: reminder - feedback on revised paper version!!!

SOCOL meeting, 6 April 2021

- CCMI-2: Eugene completed all simulations; still waiting for approval of cmorized output to upload the data onto archive
- Eugene: collected queue wait times from several runs; queuing times range from seconds up to 10

hours; Euler command: bbjobs

- Sandro: will ask Ari, Jianxiong and Debra to join SOCOL meeting on 20 April for discussion on condensation/nucleation in SOCOL-AER; shift SOCOL meeting to 2 pm
- Iga: updated her manuscript and included figure showing average AoA? as function of atmospheric O₂ content - pos. correlation
- Timofei: involved in Austrian-Czech proposal on modified orographic GW scheme for ECHAM; idea: add some randomness to zonal flow close to surface by better resolving grid cell orography; EMAC and SOCOL as test models
- Arseniy: registered Iodine manuscript
- Andrea: Jonas managed to run SOCOLv3 on Euler VI using 150 CPUs with gcc compiler (nproca = 10, nprocb = 15); Andrea currently running 10 year simulation with different model versions (merging) and compilers (intel and gcc) to test simulated model climatology with C2SM? sanity checker

SOCOL meeting, 30 March 2021

- Iga: presented changes in her manuscript on ozone dependency to atmospheric O₂ concentration
- Eugene: still waiting for instructions to upload CCMI-2 results; SOCOL is the first model with results!!!
- Gabriel: Urs does not run CESM1 anymore, but CESM2; model runs on Euler VI with following compiler: module load new; module load parallel_studio_xe/2018.1i ; compiler: ifort; MPI run command: mpirun
- Sandro: SOCOL-AERv2 - call order of nucleation and condensation has impact on sulfuric acid aerosols, not so much on the burden, but on the size distribution; decreasing the microphysical time step from 6 min to 36 s (200 instead of 20 subimesteps) leads to very similar sulfur budgets, however, this makes the model too expensive. Beiping suggested to switch the order of condensation and nucleation such that nucleation is called first as this process is more sensitive to the H₂SO₄? vapor pressure. For volcanic eruptions, a decrease in the microphysical timestep might be necessary. Timofei pointed to Jianxiong's PhD? thesis where he showed Pinatubo simulations with different microphysical timestep: 6 min led to a reasonable result; this is probably the reason for the current setting.

SOCOL meeting, 23 March 2021

- Euler:
 - ◆ SOCOLv3 on multiple nodes on Euler VI: Timofei pointed out that this might not work in T42 resolution (constraints on nproca, nprocb settings)
 - ◆ Eugene reported on extremely long queueing times on Euler (16 hours), which makes it impossible perform REF-D2 with SOCOLv4 on Euler (140 years with max 2 years/day)
 - ◆ Gabriel will contact Urs re: CESM performance on Euler VI and problem of long queueing times, multi-node problems on Euler VI; with the current set-up we cannot make full use of our share
- C2SM? released a sanity checker for climate models, could also be useful for SOCOL: <https://github.com/C2SM-ICON/clim-sanity-checker>
- Sandro: Order of nucleation and condensation in AER has significant influence on size distribution in case of geoengineering. Sandro is planning to do tests with reduced microphysical timestep; will contact Jianxiong/Beiping and check Jianxiong's PhD? to get more information.
- Eugene: submitted first CCMI-2 data to CEDA
- Calculation of residual circulation/TEM:
 - ◆ the namelist setting PUTDATA = 24, 'hours', 'first', 0 outputs **instantaneous values every 24 hours, not daily averages!!!** This leads to artefacts in the calculated TEM in the upper stratosphere/mesosphere. If you intend to calculate the residual circulation from your model output, set PUTDATA = 12, 'hours', 'first', 0 or better PUTDATA = 6, 'hours', 'first', 0 or even PUTDATA = 4,

'hours', 'first', 0

- ◆ Alternatively, accumulate output streams by hand as done in chem_m stream (mo_socol_streams.f90): gridpoint T, u, v, w (Pa/s) [should be variable **vervel** defined in mo_scan_buffer.f90]

SOCOL meeting, 16 March 2021

- Euler:
 - ◆ multi-node problem on Euler VI: newer gcc should work with openmpi4; ICON does not compile with that gcc version, therefore ICON can use only openmpi3.x => not multi-node compatible
- Sandro: data from geoeng. runs for calculation of residual circulation available
- Eugene: CCMi simulations (REF-D1) almost ready; David sent instructions how to upload data; still waiting for REF-D2 experimental set-up
- Timofei: showed results from ISA-MIP simulations for Pinatubo; SOCOL-AER compares well with other models; reasons for differences between HIRS and SAGE-3lv4 in 1993/1994?
- Pavle still working for Tom's group until end of March; will take a position as risk modeller in London
- Eugene will announce short PostDoc? as Timofei will keep working 50% for Davos after moving to Vienna

SOCOL meeting, 9 March 2021

- Euler:
 - ◆ Euler VI nodes still cannot be used in multi-node mode since Intel compiler is not compatible with required MPI version; Euler admins are aware of this problem, but currently understaffed; no prompt solution expected
 - ◆ more information on Euler VI testing: https://scicomp.ethz.ch/wiki/Euler_VI_Testing
 - ◆ SOCOLv3 users may use new nodes with "-R beta" to free "old" nodes for SOCOLv4 users
 - ◆ Timofei tried to compile SOCOL4 with gcc, did not work; Gabriel/Timofei may also contact Jonas who is currently testing SOCOLv3 with different compilers
 - ◆ Gabriel will get in contact with Euler admins regarding Euler VI nodes because his intended WACCM runs require multi-node jobs
- CSCS: next deadline for proposals 14th May; Gabriel might submit a proposal for SOCOLv4 runs with help of Timofei/Eugene
- merged SOCOLv3: V3, AER and Se-versions are now completely merged, except chemical mechanism; Jonas is working on the test suite; as soon as merged version passes all tests, it will be released to the SOCOL group
- Sandro: working on the implementation of solid particles
- Marina: working on paper draft on surface climate impacts of ozone extremes

SOCOL meeting, 2 March 2021 - Git introduction

- Preparations:
 - ◆ Git installation: <https://github.com/git-guides/install-git>
 - ◆ Jupyter notebook installation: <https://jupyter.readthedocs.io/en/latest/install/notebook-classic.html>
 - ◆ Bash kernel installation: https://pypi.org/project/bash_kernel/
 - ◆ Course material: <https://git.iac.ethz.ch/juckerj/git-course>; access to the IAC Gitlab via ETH account: choose LDAP login and login with your ETH username and password
- Slides by Jonas Jucker, C2SM
- Movie zoom session

SOCOL meeting, 23 February 2021

- Ari, the SOCOL group wishes you all the best for your future! We stay in touch!
- Gabriel: Laura and Nora started their MSc projects; Laura will analyze Pavle's runs re solar signal, and Nora will look into SH strat-trop-coupling, first in WACCM runs, later also SOCOL runs
- Timofei: Looking for ERA5 nudging files (Finnish colleagues plan to run nudged simulation from 1950 onwards to study Be deposition); Ari compiled T42L39 nudging files for 2015 to 2019 only
- Andrea: C2SM will further support merged SOCOL repos

SOCOL meeting, 16 February 2021

- Eugene: first set of CCMI-2 runs cmorized, waiting for final upload instructions
- Timofei: ISA-MIP Pinatubo experiments uploaded, Agung and El Chichon to come
- Ari: what happens to git repos when owner leaves IAC? Urs: repos never deleted, but an IAC member should be added as maintainer to guarantee access
- Arseniy: working on Iodine paper
- Andrea: PSC evaluation paper by Michael Steiner published

SOCOL meeting, 9 February 2021

- Timofei submitted SOCOLv4 paper to GMD; congrats, Timofei!!!
- DECK simulations with SOCOL4: Gabriel interested in SOCOLv4 simulation from 1850 to 2000; boundary conditions for pre-industrial? Computer time? coupled SOCOLv4 on 264 CPUs needs about 1 day for 2 years; w/o AER about 1/3 faster; Gabriel and Timofei will discuss details of planned simulation separately.
- Timofei: output from ISA-MIP simulation processed/uploaded to DKRZ;
- CMOR: Timofei has CMIP5-compliant CMOR version; Eugene has a CMIP6-compliant version
- Geoengineering runs within CCMI-2:
 - ◆ Beiping is working on the radiative input as done for CMIP6
 - ◆ Timeline: Call for model simulations expected March/April; simulations to be finished by end of summer
- CCMI-2:
 - ◆ future simulations also with prescribed SSTs, most likely just one SST data set (from CAM5?) for all participating CCMs; SOCOLv4 w/o ocean & AER: 6 yrs/day on CSCS
 - ◆ *Correction: Gabriel checked his meeting notes: "...the choice of the ocean coupling for ref-D2 will essentially be up to modeling centers... there might be a "default" SST forcing for atmosphere-only models (some CAM5-based data-set, as it was done in CCMI-1... just that now, CAM6 is an outlier in terms of climate sensitivity so I am not sure what model they'll choose...) but it's not going to be a mandatory forcing data-set"*
- Tom called for topics for upcoming MSc thesis fair; Timofei and Marina might offer some projects
- Please provide feedback to Iga's paper ASAP!!!

SOCOL meeting, 2 February 2021

- merged SOCOL-version: potential contributions to master version discussed. Open questions: Do we want to include iodine chemistry into master version or keep it separated? Implement possibility to nullify iodine species/emissions and run model such w/o iodine? How much more expensive is iodine chemistry/tracer transport? Same questions apply to additional CFCs and VSLs. Andrea will get in contact with Jonas about the further procedure.
- Sandro gave a presentation on his calcite project and showed what he did so far in terms of microphysics of solid particles. Sandro will organise side meeting on microphysical details for those who are interested.
- Franziska in February still on sick leave, but seems to be on good way. Comeback to IAC still open.

SOCOL meeting, 26 January 2021

- Andrea: presented concept for merged SOCOLv3 git repository; SOCOL group was positive about the suggested concept. Andrea will collect latest model versions and modifications that should go into master from all group members and coordinate further progress with Jonas.
- Eugene: troubles with installing cmor on hydro, looks like gcc math library issue; will contact IAC-Linux support
- Gabriel: future CCMI simulations: geoengineering Tier 1 activity; prescribed aerosol distribution from WACCM simulations - radiative effect, photolysis? Runs will be with prescribed SSTs
- Status of GeoMIP activities in Harvard? Eric will leave academia in summer; probably no further SOCOL-AER activities in Harvard
- Timofei:
 - ◆ asks for feedback on revised SOCOLv4 paper draft by end of week
 - ◆ Louise purchased one node and 10 TB of storage on Euler; Timofei moved data from /cluster/work/climate to Louise's directory, but due to technical reasons data still count to quota for /cluster/work/climate

SOCOL meeting, 19 January 2021

- Discussion about radiative imbalance in SOCOLv3-versions:
 - ◆ SOCOLv3 (time slice simulations) shows an imbalance at ToA of 2-3 W/m² (depending on the exact model version), with higher ASR than OLR; with prescribed SSTs the imbalance is not such an issue as roughly 70% of the surface temperatures are fixed. Gabriel found similar imbalance in SOCOLv3-MPIOM for a 2000 time slice run, and at first glance no response of the surface temperature to this imbalance over a time period of about one century. Eugene and Timofei mentioned a water correction which is applied in MPI-ESM by default to balance different energy fluxes. Not sure that this is done in SOCOLv3-MPIOM as well. Gabriel will contact Julien/Stefan to find out if they know anything about a water correct or whether they looked into ToA radiation budget. Furthermore, Gabriel will look into the ocean heat content in his runs.
 - ◆ SOCOLv4 simulations: transient simulation with coupled ocean shows a reasonable trend in ToA imbalance (=climate change), while the new CCMI-2 reference simulation with prescribed SSTs shows a rather strong increase in ToA imbalance.
- EGU 2021: Christina, Iga and Marina will submit an abstract
- SNF projects: Since no money was spent on travelling in 2020, can the money be used for anything else?

SOCOL meeting, 12 January 2021

- Belated Happy New Year!
- Timofei got a permanent position with Harald Rieder in Vienna (BOKU) offered, congrats!
- In case Timofei accepts, Eugene is looking for a new Post-Doc for the remaining project duration (until end of 2022)
- C2SM? newsletter: Tatjana will send contribution on POLE project / CCMI-2, Ari might send summary of his Se project/papers
- EGU 2021: Christina, Marina and Iga will submit an abstract
- Andrea: new wiki page documenting SOCOLv3 related bug fixes

SOCOL meeting, 15 December 2020

- Timofei presented seasonal figures for atmospheric O₂ / O₃ study (Which atmospheric O₂ concentrations is optimal for ozone?)
- Discussion of comments on SOCOLv4 paper draft; Timofei intends to send around new draft version

on Fri, 18 Dec; maybe additional meeting next Tues, 22 Dec

SOCOL meeting, 8 December 2020

- all: intense discussion about atmospheric O₂ / O₃ study (Which atmospheric O₂ concentrations is optimal for ozone?)
 - ◆ 3D simulations show maximum total column ozone for present-day O₂ concentrations, while 1D simulations assuming tropical profile show highest TOC for lowest O₂ concentrations; argumentation - the lower atmospheric O₂, the more UV radiation can penetrate deep into the atmosphere, where air density is higher and therefore more O₃ is formed; 1D model neglects large-scale dynamics - can difference between 1D and 3D results be explained by dynamics and ozone-dynamics feedbacks?
 - ◆ nudged simulations were suggested to distinguish chemical and dynamical effects: caveat: nudging will not result in identical dynamics as climate response to ozone changes is too strong (up to 40 K temperature difference in upper stratosphere). Offline runs (CTM mode) would guarantee identical dynamics, but additional code modifications would be necessary to include water vapor feedbacks and to ensure comparable chemical conditions

SOCOL meeting, 1 December 2020

- Andrea: reported on bug in SOCOL-AER concerning aerosol-radiation coupling, which leads to "double-counting" of sulfate aerosols (AER and tropospheric climatology) in lowermost model levels; furthermore, for those model levels extinctions are fed into radiation code, not optical depth. Short documentation of model bug; corrected source code
- Laura: would like to start looking into existing SOCOL runs for her MSc project (Influence on solar variability on North Atlantic Winter Climate); Pavle's runs could be a starting point (1850-1950/2000s, various set-ups: reference - /net/hydro/chemie/pavlea/reference, fixed GHG - /net/hydro/chemie/pavlea/without_GHG); Pavle's runs used Shapiro forcing; for comparison with WACCM and GISS maybe better SOCOLv4 with CMIP6 forcing
- Pavle hired for a short time period to continue work on Laschamps event with SOCOL-MPIOM
- Gabriel: SOCOL-MPIOM - missing library can be found here: /cluster/home/gchiodo/libraries/netcdf-ift-openmpi/
- Tatjana: SPARC data set for model validation finally available: data set, reference paper
- Christina: run without T nudging produces same temperature as run with T nudging => probably an issue with namelist (not updated)
- Timofei:
 - ◆ Louise bought 1 node and 10 TB on Euler; not yet part of climate shareholder group
 - ◆ Information for users belonging to various groups: https://scicomp.ethz.ch/wiki/Multiple_shareholder_groups
 - ◆ Feedback on SOCOLv4 paper draft until 10 Dec!!!
- Arseniy:
 - ◆ new iodine meeting on 17 Dec to discuss model results; last week not enough time
 - ◆ correlation between (observed) proxies used for DLM for period before and after 1998, no dramatic correlations; Gabriel mentioned that AO/AO and trend could be correlated on short time scales

online SOCOL day, 24/25 November 2020

- weekly SOCOL meetings from now on

SOCOL meeting, 10 November 2020

- SOCOL-day:

- ◆ will be held online: Tuesday, 24 Nov, 13:00-17:00 (with breaks); Wednesday, 25 Nov, 9:00-13:00 (with breaks)
- ◆ rough schedule: start each halfday with 3 presentations from MSc students (10 min presentation & 10 min discussion); first day one hour each on SOCOLv3 (Andrea & Co) and SOCOLv3-MPIOM (Gabriel & Co); second day SOCOLv4 (Timofei & Co), CCMI (Eugene & Co) and infrastructure/discussion (all)
- SOCOLv4 in AMIP mode: LCOUPLE = .FALSE. is only one step; model needs to be recompiled with modified configuration, otherwise model run will not terminate correctly (oasis coupler and other submodules keep running)
- CCMI-2: SOCOLv4 spin-up 1950s running; ocean and interactive aerosols switched-off => model faster, 3.5 instead of 5.3 hrs/(yr ?); simulations are currently running on CSCS, since Timofei and Eugene still have computational time available from last term
- SOCOL4 evaluation paper: Timofei will soon send around manuscript of validation paper; model in L90 twice as expensive as in L47;

SOCOL meeting, 27 October 2020

- SOCOL-day: Given the current development of the Covid crisis, we cannot do the SOCOL in person anymore; instead we will go for 2 half-days online meetings; Timofei will ask Tom about possible dates and come up with suggestions
- CCMI: SOCOLv4 runs nicely in AMIP mode and can therefore be used for REF-D1 with prescribed SSTs; Eugene will do the model simulations and output data postprocessing
- Arseniy: presented DLM results from SOCOLv4 reference simulations and sensitivity runs, e.g. fixed GHG, fixed CFCs, etc. it was suggested to run several ensemble members for the reference as well as for the sensitivity simulations.

SOCOL meeting, 13 October 2020

- SOCOL-day: 27 November 2020 in Davos; Timofei will send around link to google docs to collect ideas, topics, etc.
- CCMI:
 - ◆ Timofei will look into problem of running SOCOLv4 with prescribed SSTs again; Timofei once tested a version of SOCOLv4 coupled to ECHAM6 instead of MPI-ESM and this version was very slow
 - ◆ CCMI REF-D1 experimental set-up and data request
- Euler6: SOCOLv4 runs perfectly on Euler4 and 5, but not multi-node on Euler6; same problem with WACCM; for SOCOLv3 there is no difference between Euler 5 and 6.
- CSCS: SOCOLv4 back to life after CSCS upgrade
- Arseniy: student for semester project (3 weeks), analysing SOCOL simulations for Iodine impact on ozone

SOCOL meeting, 29 September 2020

- PMOD got new proposal for computer time at CSCS for 2 years accepted
- CCMI finally came up with experimental set-up for new simulations in support of upcoming WMO assessment; REF-D1: hindcast 1960-2018 with new forcings CCMI-2022, timeline: data to be submitted by January 2021
 - ◆ in principle the SOCOL group would like to participate
 - ◆ SOCOLv4 or SOCOLv3?
 - ◇ SOCOLv4 shows better performance wrt total ozone column, but it does not yet run with prescribed SSTs; Eugene will clarify with David whether a coupled ocean is also acceptable for REF-D1. Furthermore, after a software update the model does currently not work on CSCS; Arseniy will test SOCOL4 in multi-node mode on different Euler generations

- ◊ SOCOLv3 would be available and run on Euler with reasonable speed. Manpower?
Maybe we could hire someone for a few months?
- ◊ for a future simulation (REF-D2?) it will be preferable to use SOCOLv4 with interactive ocean
- Andrea: presented results from SOCOL simulation with N₂O₅ hydrolysis on cloud droplets and cloud ice particles implemented as heterogeneous reactions; first results show that gas-phase N₂O₅ levels in troposphere are now very (too?) small (sub pptv); Ari made comment that cloud coverage has to be taken into account to restrict reaction to cloudy part of the grid cell.

SOCOL meeting, 15 September 2020

- new day for SOCOL meetings: Tuesday, 1:00 pm
- next SOCOL day in Davos: Louise approved visit of SOCOL group in Davos; seminar room tolerates 16 people; Timofei will set up doodle with potential Fridays (Tom's preferred day during the semester)
- Timofei: SOCOLv4 evaluation and paper draft almost done; Timofei will give presentation at next meeting; draft to be circulated within SOCOL group for further input
- Euler: PMOD would like to invest 1000 CHF into storage on /cluster/work/climate; problem: Louise (as ETH professor) does not own nodes, storage can only be purchased by groups with CPUs... Could Tom or Gabriel act as front men?
- Sandro and Ari are working on implementation of solid aerosol particles into SOCOL-AER; as soon as it works technically, module can be implemented into SOCOLv4 as well.
- Marina and Gabriel: big differences in ozone variability between SOCOL-MPIOM and SOCOL-AER; related to coupled ocean and missing ocean variability (ENSO) in SOCOL-AER with climatological SSTs? Different (tropospheric) climate? Suggestions: run SOCOL-MPIOM with prescribed SST climatology (lcouple = .F., no guarantee that the model will run with this setting...)

SOCOL meeting, 3 September 2020

- no meeting, Tom's group retreat

SOCOL meeting, 20 August 2020

- new time for SOCOL meeting: one possibility would be to go back to Wednesday 2:00 pm, alternating with the group meeting; to be checked with Tom and the other SOCOLists
- Timofei:
 - ◆ for some combinations of NCPU, NPROCA and NPROCB the model hangs at memory allocation in SR so2_pin_eruption (mo_socol_sulfur_emiss.f90)
 - ◆ SOCOLv4 evaluation paper is on a good way
 - ◊ Stratospheric NO_x overestimated compared to ACE-FTS; maybe NO photolysis underestimated
 - ◊ HCl looks fine
 - ◊ H₂O in mesosphere underestimated; most likely too strong photolysis by Ly-alpha; old cross-sections used, to be updated
 - ◊ CH₄ overestimated above 10 hPa; either also related to photolysis by Ly-alpha or too weak CH₄ oxidation
 - ◊ N₂O also overestimated above 10 hPa;
 - ◆ SOCOLv4 does not run on multinodes on Euler so far, because of missing (outdated) MPI library for intel compiler; Arseniy runs SOCOLv4 at the moment on one node only; PMOD hopes for new computational time on CSCS in fall
- unfortunately PMOD colleagues will not join group retreat, as they are not allowed to travel for work 😞

SOCOL meeting, 6 August 2020

- Marina: showed a comparison of temperatures and wind speeds over the northern polar latitudes as simulated with SOCOL-AERv2 and SOCOL-MPIOM (200 yrs, time slice simulation year 2000); SOCOL-AERv2 shows a weaker polar vortex, however, there are several differences between both model versions: horizontal resolution (T31 vs T42), prescribed vs interactive SSTs, CCMI chemistry, solar constant, ???; exact reason for the differences hard to identify; Eugene suggested to look at heat flux at 100 hPa ($v'T$). Marina will present in the group meeting next week, 12 Aug.
- Arseniy: submitted his first paper, now waiting for an editor.
- Sandro:
 - ◆ first simulations with calcite emissions (advection only; advection + sedimentation, advection + sedimentation + non-interactive wet and dry deposition); first results look promising, but total calcite budget does not completely match emitted mass (1.93 or 1.99 Mt vs 2 Mt of emissions), alarming???
 - ◆ problems with MLO: unstable MLO simulations based on heatflux file from CESM1-CAM5 (2035-2044) reference run. Other MLO runs based on CESM1-CAM5 (2040), MIROC, or CMIP PCMDI AMIP are stable; problem with SST climatology CESM1-CAM5 (2035-2044)?
- Timofei/Christina: Atmospheric sulfur burden in nudged simulations higher than in free-running simulations; potential reasons:
 1. lower marine DMS emissions due to weaker surface winds in nudged simulations -> goes into wrong directions
 2. Higher aqueous phase oxidation of SO₂ in free-running -> enhanced wet removal of aerosols;
 3. higher stratospheric OCS burden in nudged simulation; might indicate stronger convective transport in nudged simulations; see also Zhang et al., ACP, 2014

SOCOL meeting, 23 July 2020

- no meeting

SOCOL meeting, 9 July 2020

- Arseniy: presented paper draft on solar signal in mesospheric H₂O and CO in CCMI specified dynamics runs compared to GOZCARDS data; H₂O shows negative correlation (H₂O photolysis enhanced during solar max.), while CO shows positive correlation (CO₂ photolysis enhanced during solar max.); some discussion about impact of nudging: Arseniy might repeat MLR analysis for free-running SOCOL simulations or simulations with troposphere only nudged (data to be provided by Andrea); Tom and Andrea will read paper until end of July
- Iga: presented results of SOCOLv2 simulations (prescribed SSTs) with varying O₂ content (5% to 40%); current 21% O₂ result in highest global mean TOC, but not much change for +/-5% O₂ content; the lower O₂, the lower the altitude of max. O₃ number concentrations, and vice versa; shift in O₃ profile has strong impact on stratospheric temperature distribution; analysis of circulation changes ongoing
- Timofei/Christina: presented sulfur budget from free-running and nudged simulation; nudged shows 10% higher sulfur burden; different wind fields close to surface affect DMS emissions (lower in nudged run) and also dry deposition; significant differences in SO₂ aqueous phase oxidation and transport to stratosphere - convection in nudged runs?

SOCOL meeting, 25 June 2020

- Andrea:
 - ◆ Showed simulated HNO₃ distributions from SOCOLv3.1 compared to CAMS, ACE-FTS and GOZCARDS; old "wet deposition" underestimates HNO₃ in lowermost stratosphere in high

lats, most likely due to upper boundary of 160 hPa; new wet deposition overestimates HNO₃ in troposphere, most likely due to missing wet deposition on/by ice clouds; adding ice water content to liquid water content improves simulated tropospheric HNO₃. CAMS HNO₃ unrealistically low in stratosphere.

- ◆ Test simulation with `time_step_len_chem = delta_time_chem` (default: `time_step_len_chem = 2.*delta_time_chem`) shows 20-30% higher ozone above 30 hPa, but 90% less ozone in lower stratosphere, especially high lats. Reasons so far unknown. Eugene suggested to look at tracer tendencies.
- Christina: Stratospheric aerosol burdens show large variability in free running ensemble simulations after volcanic eruptions in high latitudes; maybe related to low injection height and internal variability of tropopause altitude. Much better internal agreement for Nabro (tropical eruption).
- Timofei: New research institute in Davos; around 40 new positions and 2 associated ETH professorships; part of WSL, located at SLF facilities; start in 2021; might be a good collaboration partner; our global modelling activities might complement regional focus of new institute

SOCOL meeting, 11 June 2020

- Ari: Managed to download ERA5 analyses and to prepare nudging files for a few months in 2019; will put instructions on SOCOL wiki
- Timofei:
 - ◆ PSC problem in SOCOLv4 solved, wrong fields outputted;
 - ◆ SOCOLv4 tape recorder compared to GOZCARDS; SOCOL about 2x faster; question: what has larger impact on BDC - nudging or vertical resolution?
- Andrea: we have now a routine to calculate RCTT (residual circulation transit time, <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2013JD021417>; backward trajectories released at different stratospheric regions are calculated using the residual velocities until they cross the tropopause (4th order Runge-Kutta-scheme);
- Eugene: new paper on age of air: <https://www.atmos-chem-phys.net/20/5837/2020/acp-20-5837-2020.pdf>
- Christina:
 - ◆ showed first results between SOCOL-AER and MIPAS-SO₂ / sulfate aerosol measurements from 2008-2011; SOCOL seems to overestimate SO₂ and aerosols after Nabro; unexplained SO₂ peaks in 2010 in MIPAS, maybe from fires?
 - ◆ next steps: analyse L90 simulation; perform simulations with different volcanic datasets
- Timofei suggested to have another SOCOL day in early autumn
- Andrea will look into 4h chemical timestep issue

SOCOL meeting, 28 May 2020

- Marina/Gabriel: showed results from "NOCHEM" (= O₃, ODS and N₂O decoupled, H₂O and CH₄ still coupled) simulations with SOCOL-MPIOM and SOCOL-AERv2 using a prescribed ozone field (zonal monthly means on pressure levels) from a fully interactive run. The standard routine `mo_o3clim.f90` from ECHAM5 performs a linear interpolation to model levels which introduces some deviations from the input O₃ field, in particular around the tropopause and in the upper stratosphere. This in turn leads to temperature differences between the fully interactive run and the "NOCHEM". Inputting O₃ on model levels avoids this problem and leads to a much better agreement in mean temperatures. This procedure will be implemented as alternative to standard SOCOLv3.
- Ari: Nudged simulation for Sep/Oct 2019. As ERA-interim end in Aug 2019, Ari will try to create nudging files based on ERA5.
- Timofei: presented first comparison of zonal mean O₃, H₂O, HCl, CH₄, HNO₃ from SOCOLv4 with ACE-FTS; for comparison of gas-phase H₂O and HNO₃ PSCs (ice and NAT) have to be subtracted; there seems to be an issue with PSC output streams in SOCOLv4
- Arseniy: showed results of a DLM analysis of Will's BASIC data set and SOCOLv4 output; some open questions about treatment of missing data and units

- Euler: Not yet back in operation again. All ETH users are asked to change their passwords!

SOCOL meeting, 14 May 2020

- Timofei:
 - ♦ presented first outline of SOCOLv4 validation paper
 - ♦ comparison of ENSO index from SOCOLv4 with ERA5: simulated amplitude similar to reanalysis data; after 2015 phase in contrast to ERA5 >> potential reason for deviations in total column ozone?
- Andrea: presented results of sensitivity simulations wrt N₂O₅ hydrolysis on cloud droplets as part of wetdep; suggestion: instead of coupling to wet deposition scheme implement N₂O₅ hydrolysis on cloud droplets as heterogeneous reaction ($\gamma = 0.1$ for ice and water)
- Arseniy: presented first results of a DLM analysis of Will's BASIC data set

SOCOL meeting, 30 April 2020

- SOCOLv4 validation:
 - ♦ largest deviations in 2m air temperature close to Antarctic ice edge
 - ♦ on global average SOCOLv4 slightly warmer than ERA5
 - ♦ 2m air temperature trends (globally and spatially) in good agreement with ERA5; additional reanalyses, e.g. MERRA-2, for evaluation;
 - ♦ total ozone column: also good agreement with obs; Pinatubo effect on average slightly underestimated; individual ensemble members overestimate Pinatubo drop
 - ♦ large variability during past 5-6 years
 - ♦ Gabriel might provide FUPSOL data (stored in Bern) for comparison between SOCOLv3-MPIOM and SOCOLv4
- Arseniy: got model output from CAM-Chem group; plotted iodine does not look like in papers; gas-phase I_y decreases with altitude - impact of aerosol uptake?
- CSCS: Timofei and Eugene will submit new CSCS proposal soon; scaling tests show good scalability of SOCOLv4 on CSCS, up to 500 cores
- Euler:
 - ♦ new software stack required for multi-node runs; will become default in future; SOCOL not yet tested with new software
 - ♦ Euler VI nodes: SOCOLv3 run-script does not work, because determination of rerun date via ncdump of rerun files does not work anymore; Marina contacted Euler admins
- Ari: study (<https://academic.oup.com/ajcn/advance-article/doi/10.1093/ajcn/nqaa095/5826147>) found positive correlation between Se hair content and cure rate of Covid19 patients in Chinese cities; Ari and Jing repeated analysis with data from 30 Apr: no correlation anymore; might write a comment on original study

SOCOL meeting, 16 April 2020

- Andrea will check possibility to use Microsoft Teams for future SOCOL meetings instead of Zoom
- Timofei: comparison of ozone distribution from SOCOLv4 with observational composites and chemical reanalysis data; SOCOL does not reproduce "banana shape", only in nudged mode there is a slight banana shape.
- Arseniy: CAM-Chem group uses different gammas for ice-recycling and non-ice-recycling case, i.e. in non-ice-recycling case, when no heterogeneous reactions of iodine species take place, the uptake coefficients are much smaller. According to Tom, the smaller gamma is justified, because without reactions nothing will happen with iodine on an ice surface, but it will go back to gas-phase. To be verified.
- Ari: Does SO₂ show a similar decrease as NO_x given the Covid lockdown? Could the current situation be used to constrain contribution of SO₂ to stratospheric sulfate aerosol, e.g. if SO₂ and aerosol showed a simultaneous decrease in observations?

- Gabriel & Marina: goal: investigate impact of interactive ozone on model variability. Current task: run SOCOL (SOCOL-MPIOM Fupsol-2 and SOCOL-AERv2) with prescribed ozone climatology (monthly and zonal average) taken from SOCOL run with interactive ozone, and check mean climate state: substantial temperature difference around 60 km - related to daily ozone cycle and SRB_LYA_HEATING (or other bands like Hartley and Huggins)?
- Save the date for Ari's PhD defense: 13 May 2020, 15:00, byo apero!

SOCOL meeting, 2 April 2020

- Timofei:
 - ◆ collected several observational data bases for model evaluation (GOZCARDS, ACE-FTS climatology, CAM chemical reanalysis); data will be made available on hydro
 - ◆ HPC proposal for Finnish Computer Center was granted; goes along with a visit (8 weeks?) to Finland
- Franziska: presented first results of photolysis rates comparison between SOCOL LUT and Cloud-J; open questions/next steps:
 - ◆ J(O₂) from Cloud-J above 50 km larger than LUT: Schumann-Runge-bands treatment?
 - ◆ NO₃ cross sections increase with decreasing T - reason?
 - ◆ effective wavelength per bin?
 - ◆ Run Cloud-J with surface albedo = 1 to see effect on Rayleigh scattering
- Submission deadline for Quadrennial Ozone Symposium, 4-10 Oct 2020 (<http://qos2020.yonsei.ac.kr/>) shifted to 29 May 2020

SOCOL meeting, 19 March 2020

- Arseniy: heterogeneous chemistry on ice removes too much iodine from atmosphere, but can use gamma as a tuning factor to get close to GeosChem results
- Timofei: very good agreement between SOCOLv4 and MSR ozone. SOCOLv4 now includes preliminary corrections for photolysis and HNO₃ scavenging in upper troposphere
- Timofei + Christina: aerosol lifetime after volcanic eruptions may be too short compared to observations, more details to follow
- Franziska will give a photolysis update at the next meeting
- Iodine meeting was moved to 26 March, 2:00 pm on Zoom

SOCOL meeting, 5 March 2020

- Christina Brodowsky started her BSc thesis on simulating recent small-scale volcanic eruptions with SOCOL-AER at PMOD with Timofei.
- Timofei:
 - ◆ prepared and presented slides for upcoming C2SM GCM WG meeting on 10 March
 - ◆ revised CSCS proposal to be submitted in May; will get in contact with Gabriel, who might submit another proposal based on the performance tests for SOCOLv4
 - ◆ new reference simulation with SOCOLv4 incl. all recent big fixes (HNO₃ wet deposition, photolysis, lightning NO_x,...); total O₃ column from first 10 years looks very promising
 - ◆ MSc student interested in topic on Arosa ozone time series; Timofei will meet her next Tuesday after the C2SM workshop
- Eugene: cdo with cmor option compiled on Euler; default cdo version on IAC Linux also includes cmor option, but I do not know whether it is CMIP5 or CMIP6 compatible
- next iodine meeting: 24 March, 10:00 am in D26.2

SOCOL meeting, 20 February 2020

- new CFC-11 scenarios: no updates available so far; Eugene wrote to David Plummer

- CMIP6 emissions: historical period for T63 ready (Timofei); future to be done; as soon as everything is available, also in T42, the input data will be provided on Euler
- C2SM GCM WG meeting, 10 March 10:15-12:15: Timofei will present 1-2 slides on SOCOL activities; he will ask for input within the next two weeks; should be ready for discussion in the next SOCOL meeting
- Arseniy:
 - ◆ total iodine (Iy) 10x higher above 500 hPa than GeosChem model
 - ◆ new emissions from Saiz-Lopez have no impact on this problem
 - ◆ online calculation of HOI and I2 emissions leads to overestimation due to tropospheric high O3 bias in SOCOL
 - ◆ problem with deposition rates? Ari suggested to check chemical conversion rates and lifetimes of individual I species
- Timofei:
 - ◆ submitted European HPC proposal
 - ◆ was asked to participate in a Horizon2020 proposal on S-containing species in the UTLS region together with Envisat community
 - ◆ SOCOLv4: Timofei presented results of further sensitivity studies
 - ◇ nudging reduces UT/LS O3 bump
 - ◇ Bug in O2 photolysis responsible O3 bias in LS -> correction could be implemented into LUT code until online photolysis scheme is available
 - ◇ simplified photolysis and underestimated HNO3 washout responsible for tropospheric O3 bias; in addition to interactive wet deposition Timofei reactivated old HNO3 wash out scheme between 300 hPa and the troposphere. Tom suggested to treat cloud ice as cloud water for the calculation of HNO3 wet deposition (as HNO3 perfectly sticks on ice).

SOCOL meeting, 6 February 2020

- Invite Steve Arnold together with C2SM for a seminar?
 - ◆ feedback from SOCOL group was rather reluctant, only Franziska and Tom indicated some interest
- Timofei presented some further results from SOCOLv4:
 - ◆ Total ozone is higher than in SOCOLv3(AER), which is already higher than obs.
 - ◆ Bias caused by tropospheric ozone and lower stratosphere; both regions equally contribute to high ozone bias. Upper stratosphere shows low bias.
 - ◇ **General question: why do we have a high O3 bias in LS in all model versions?**
 - ◆ Timofei did several sensitivity runs wrt to dry deposition, lightning NOx (lightning NOx deactivates HOx, lower HOx cycle important O3 loss mechanism in LS), strength of photolysis O3 -> O1D in troposphere (underestimated in SOCOL).
 - ◇ **Potential bug in LNOx: conversion from Tg N to Tg NOx??? To be checked**
 - ◆ Plots indicate difference in representation of tropopause in SOCOLv3 and SOCOLv4 (higher horizontal and vertical resolution, coupled ocean instead of prescribed SSTs, new cloud and radiation schemes...).
 - ◆ To disentangle chemical and dynamical effects, Timofei will do a nudged simulation, maybe with diagnostic tracers to investigate differences in transport/mixing.
- Sandro: presented AGU poster on geoengineering MIP between CESM, ECHAM-HAM and SOCOL-AER; lots of results which need further investigation; overall impression: sulfate geoengineering not a good idea.

SOCOL meeting, 21 January 2020

- Storage: from the current estimates it seems that we need about 70 TB/yr as additional storage (inofficial piece ~ 100 CHF/TB for 5 yrs)
 - ◆ Sandro: 60 TB

- ◆ Ari: 30 TB by end of his PhD project, could be reduced to 15 TB for longer term archiving
- ◆ Marina: 60 TB
- ◆ Franziska: 30 TB
- ◆ Davos: 50 TB, for POLE project; note: there is no money for infrastructure from SNF; to be skipped if not affordable
- ◆ Gabriel: 100 TB
- Until further notice the SOCOL meetings will take place on Thursdays, 1:30 pm, in D26.2. The first Thursday afternoon meeting will be on Feb 06.
- Andrea: Method of pressure interpolation (linear_p, log_p, w/ or w/o extrapolation) from hybrid model levels to fixed pressure levels can have large impact on surface concentrations of tracers. For example, NO₂ profiles from WACCM applying various interpolation methods.
- Ari: Boundary conditions and restart files for end of 21st century for SOCOLv3-AER?
 - ◆ CCMI boundary conditions for RCPs available
 - ◆ Timofei has SOCOL-AER restartfiles, but runs were performed with bugged photolysis LUTs (bug in spectral grid in LUT preparations)
 - ◆ Sandro might have boundary conditions from SSPs for 2040; to be checked; new boundary conditions should be put on Euler for group access (Gabriel will write to Sandro).
- In some SOCOL versions, the molecular weight of NO₂ is set to 44.01 instead of 46.01 (amno2 in mo_socol_constants.f90). Please check your model version.
- SOCOL Iodine meeting at ETH, Friday Jan 24, 13:00 in L17.1: Arseniy will report about current status, impact of iodine on ozone. Further improvements of heterogeneous chemistry will be discussed.

SOCOL meeting, 07 January 2020

- Storage: Urs and Tina are planning to submit a new Scientific Equipment Proposal (SEP) for storage for the upcoming 3 years (up to end of 2022). Storage can be located at ETH (w/ or wo/ backup) and/or CSCS. Costs are not yet clear. Urs will ask DUSYS for some financial support. Urs wants us to fill the following table asap. We have currently 110 TB out of 240 TB used (=46%) at IAC. From today's discussion:
 - ◆ PMOD already has storage at CSCS (comes with production project); after end of project data will probably be moved to Davos (external HD).
 - ◆ Sandro estimated 50-100 TB for his PhD project
 - ◆ Ari estimated 30 TB by end of his PhD project, could be reduced to 15 TB for longer term archiving
 - ◆ Others will send their estimate until next SOCOL meeting in two weeks
- Upcoming SOCOL meetings: Marina will be in Chile in March and April (4 hours behind); Sandro, Franziska and Tom will be involved in teaching activities Thursday mornings => preliminary schedule: Thursdays, 1:30 pm, D26.2 from 20 February until end of July (or at least end of "exodus"). Final decision depends on Arseniy's availability.
- SOCOLv4: Timofei presented updated results of SOCOLv4 hindcast reference run.
 - ◆ Global average sea-surface temperature trend looks reasonable; however, SOCOLv4 and also pure MPIESM show too little sea ice coverage
 - ◆ In the Arctic, SOCOLv4 and MPIESM start with same sea ice coverage, but show different temporal evolution - related to high tropospheric ozone bias in SOCOLv4?
 - ◆ SOCOLv4 shows about 10 DU higher total ozone column than SOCOLv3 CCMI, partly(?) explained by interactive dry and wet deposition scheme; contribution from too low O₃ -> O(1D) photolysis? Compared to CMIP6 ozone forcing data set, SOCOLv4 overestimates O₃ in lower stratosphere. Timofei will do additional test.
- DUSYS MSc student (Rafael Bonafini) interested in doing his MSc thesis with Timofei on volcanic eruptions. Tom will get in contact with Timofei and talk about details.

SOCOL meeting, 10 December 2019

- new boundary conditions, model updates?
- Eugene provided Stergios Misios with the full precip data from our CCMI rerun; so far no reply from Stergios; Eugene will ask for feedback.
- SOCOLv4 reference run is smoothly running on CSCS; the first 25 years do not show any obvious drifts or biases! Congrats to Timofei and colleagues!
- Tom promised to send an email to Will and Gabriel to resume the CCMI discussion. They will hopefully manage to meet and discuss before Christmas.
- The next two SOCOL meetings will take place on 07 and 21 Jan 2020 (Tues). Afterwards we will likely move back to Thursdays. Happy holidays and a happy new year to everyone!

SOCOL meeting, 26 November 2019

- Precip data from CCMI runs: Laura has complete precip data from REF-C1 and REF-C2 (another realization than that uploaded to BADC); she will provide the data to Eugene
- Laura reported about ozone workshop in Melbourne: gaps in last WMO O3 assessment have been identified; there are concerns that new halogen and VSLS scenarios are not available soon; Robyn Schofield has strong interest in VSLS, iodine (maybe contacting her would be worth for Arseniy)
- SOCOLv4 is back on CSCS; Sylvaine helped to fix the problem
- new boundary conditions, model updates?
 - ♦ Timofei showed differences between CCMI and CMIP6 forcings, (see here) (CMIP6 in orange, CCMI in blue)
 - ♦ Biogenic emissions are still a problem, since there are no emissions available on ECCAD. Also the former CMIP5 biogenic emissions are not available. Andrea will check if the original files used for CCMI are still around
- Timofei found a minor bug in mo_socol_sun.f90 (see figure below): for the slant column calculation the molar weight of dry air (amd) instead of molar weight of O2 or O3 (amo2, amo3) has to be used; *Andrea sent email on 26 Nov 2019 to SOCOL group incl. Harvard (Debra, Eric, Pete), Julien and Pavle*



Minor bug in mo_socol_sun slant column calculations for extra-heating
(versions affected: FUPSO2-2, CCMI)

```
@@ -100,7 +100,7 @@
      real :: amd = 28.9661
      real :: amo2 = 31.9988
      real :: amo3 = 44.0095
-      real :: amd = 28.9661
+      real :: amo2 = 31.9988
+      real :: amo3 = 44.0095
```

Effect:
* Molecular oxygen slant column was underestimated by 0.003 -> more heating by Sun and O3
* Ozone slant column was overestimated by 1.008 -> less heating by Hartley and Huggins

SOCOL meeting, 12 November 2019

- question by Stergios Misios: our CCMI precipitation data on BADC do not include convective precipitation. Eugene will contact Laura whether she still has raw data on an external hard disk.
- CSCS: after a software update SOCOLv4 does not run anymore on CSCS... (thanks to the Euler admins for keeping old compiler revisions and libraries!!!)
- CMOR: Timofei has to cmorize model output from ISA-MIP simulations. Andrea will send Timofei related scripts and documentation.
- SOCOLv3-MPIOM: Julien managed to get his model version running on Euler (some library was missing). He intends to repeat a simulation of the Laschamp event (reversal of Earth's magnetic field 40 kyrs ago) with FUPSO2-2 model version (for some collaboration with NZ colleagues). Andrea will invite Julien for next SOCOL meetings.
- CCMI discussion: We discussed Will's drafted email; instead of sending such an email to the model PIs and/or SPARC, it was proposed to send a more questioning email to Dave Plummer, in order to find out what is requested from WMO assessment and how is the spirit amongst the modelling groups

- is there still a substantial CCMI community or did the majority move onwards to AerChemMIP?
Will and Gabriel will discuss internally whether one of them would be willing to take a leading role in the model evaluation activities and then come back to Tom.
- new boundary conditions, model updates?

SOCOL meeting, 29 October 2019

- SOCOL workshop and visits by Liang and Eric successful; SOCOL-AERv2 now also running in Harvard (corrupt input file was reason for crashes)
- CCMI news (email D. Plummer, 24 Oct 2019):
 - ◆ planning phase for CCMI-2 prolonged
 - ◆ proposed simulations in support of upcoming WMO O3 assessment:
 - ◇ Hindcast 1960 - 2014 (REF-D1), following CMIP6 historical forcings: model data upload May/June 2020
 - ◇ REF-D2, probably following SSP2-4.5, and some additional scenarios: model data upload second half of 2020
 - ◆ WMO criticised missing model evaluation for last assessment; CCMI looks for volunteers leading a few focused evaluation efforts: there is consensus among SOCOL group that timeline is too short for proper evaluation. Will is going to draft an email to CCMI community, suggesting to indeed start the evaluation right now, but to aim for the WMO assessment in five years from now.
- Questions by Margot Clyne (VolMIP paper, email 15 Oct 2019): *email sent to Margot on 31 Oct 2019*
 - ◆ Q1: Yes
 - ◆ Q2: Andrea will ask Beiping for references, Timofei will check source code
- Arseniy - iodine chemistry: after discussions with Rainer Volkamer Tom suggested to implement heterogeneous iodine reactions into SOCOL (analogue to N2O5 hydrolysis?)
- new boundary conditions, model updates?
 - ◆ SOCOLv4:
 - ◇ CMIP6 BC ready, except biogenic emissions for tropospheric species (not provided by CMIP6) -> SOCOLv3 BC used
 - ◇ Timofei tested new tropospheric aerosol parameterisation recommended by MPI-HH -> results look reasonable, no sea ice melting
 - ◇ reference simulation will be started soon

SOCOL meeting, 15 October 2019

- No meeting this week because of visitors from China and Harvard and the SOCOL workshop!
- new boundary conditions, model updates?

SOCOL meeting, 3 October 2019

- SOCOL meetings will be on Tuesdays until Christmas; L17.1 is reserved from 8:30 to 10:00 for the following dates: 29.10., 12.11., 26.11., 10.12.
- new boundary conditions, model updates?
 - ◆ Update of Boundary Conditions to CMIP6 (T42 for SOCOLv3, T63 for SOCOLv4):
 - ◇ Timofei will set up wiki page with to do list
 - ◇ solar forcing (Eugene)
 - ◇ stratospheric aerosol (ready)
 - ◇ CFCs & GHGs (Tatjana)
 - ◇ Franziska will check NOx, CO, other tropospheric species
- Arseniy did first iodine chemistry runs with SOCOLv3: 1x Iodine emissions, 2x Iodine emissions, Pinatubo scenario (HI injection = 10% of SO2)
 - ◆ vertical profile of Iodine species seems to agree with available observations

- ◆ 1x scenario: stat. sig. decline in tropospheric ozone of around 8%, no sig. signal in lower stratosphere
- Chemical Preprocessor now on Git
- Swiss Excellence Scholarship for Colombian PhD student?
 - ◆ *Update: EMPA also not interested*
- Upcoming visits:
 - ◆ Chinese and Harvard colleagues, 14-18 October 2019
 - ◇ Anybody from Davos available?
 - ◇ *Eugene na (China), Timofei and Arseniy available on Thurs/Fri, Arseniy will be anyway at ETH on Thurs (StratChem)*
 - ◆ Rainer Volkamer (CU Boulder), week of 21 - 25 October 2019: measurements of Cl, I,... in lower stratosphere -> impact on LS ozone
- Hydro storage:
 - ◆ *Laura purged 50% of her data; only 9 TB left; overall usage 56%*
- CSCS:
 - ◆ PMOD proposal was granted for one year, but cut by a factor of 5; CPU hours for about 400 years with SOCOLv4.
 - ◆ next deadline May 2020

SOCOL meeting, 19 September 2019

- new boundary conditions, model updates?
- Skype with John Dykema & Co:
 - ◆ We invited Eric and David to visit us in (1) the week of October 6-12, or (2) the following week of October 13-19; Tom would pay for accommodation; not yet fixed
- Skype with Simone Tilmes about GeoMIP, 26 September 5 pm
- Swiss Excellence Scholarship for Colombian PhD student?
 - ◆ *Does not quite match our own research topics. Tom contacted EMPA colleagues, maybe they are interested. Andrea wrote to Carlos Gomez Ortiz and told him our decision.*
- Tom: From 14 October onwards 2 colleagues from China will visit our group for two weeks. One of them is interested in global modelling. Tom will send tentative agenda for the visit.
- Eugene's questions:
 - ◆ How to GIT our LUT programs?
 - ◇ Andrea will send around a few instructions of how to use GIT. *done*
 - ◆ I still do not understand should we use CLOUD=0 for LUT in SOCOL-AERv2.
 - ◇ *The cloud modification implemented into SOCOLv3 works only for clouds with an optical depth > 5, and the backscattering from clouds, i.e. the enhancement of photolysis rates above the cloud has not been used.*
 - ◆ Do we have EPP in SOCOL-AERv2 SD runs?
 - ◇ *No, Ari did not implement energetic particles into SOCOL-AERv2.*
 - ◆ Extension of SOCOL SD run to 2018.
 - ◇ *The output of our SOCOLv3 (CCMI version) simulations (1980-2018) in specified dynamics mode (ERA-Interim as forcings) is on hydro, For the L90 simulation only the monthly means are available, for the L39 run we still have the 6 hourly output. The output is on model levels. Chemistry output can be found in the subdirectory /chem/orig_output, meteorological output in /meteo/model_levels.*

Resolution	Model output
T42L39	/net/hydro/chemie/stenkea/afterburner/run12000_nudged
T42L90	/net/hydro/chemie/stenkea/afterburner/run13000_nudged

SOCOL meeting, 5 September 2019

- new boundary conditions, model updates?
 - ♦ Ari will send radiation look-up table for SOCOL-AERv2 (band_echam5_dryrad); Andrea will put file on euler /climate and send it to Debra
 - ◊ *done; input file incl. README available on Euler:*
/cluster/work/climate/stenke/echam5/data/SOCOL/lookup_AER
 - ◊ *new DMS concentration maps for T31 and T42 incl. README available on Euler:*
/cluster/work/climate/stenke/echam5/data/SOCOL/T\${RES}/sulfur/T\${RES}/L39_DMS_sea_c
- Potential candidate for Swiss Excellence Scholarship for Colombian PhD students?
 - ♦ Given Tom's retirement, the timeline for a PhD project is tight (starts only 01 Sept 2020); scholarship covers only ~60% of PhD salary; 40% (~20 kCHF/yr have to be found elsewhere)
 - ♦ In case Gabriel is interested, he should talk to Tom
 - ♦ Andrea asks for transcripts, everybody is asked to review application
- Potential collaboration with Harvard on volcanic eruptions and halogens, implementation of iodine chemistry
 - ♦ Eugene will send LUT code to Eric
 - ◊ *done (10 Sept 2019)*
 - ♦ Tom will reply to John Dykema and ask about some information on their plans with SOCOL-AERv2; skype meeting to talk about potential synergies?
 - ♦ general question: can Harvard group get access to our SOCOL wiki?
 - ◊ *The SOCOL Wiki could be made visible to external users*
- Geoengineering proposal (ETH grant, Gabriel and Sandro) was submitted on 1 Sept; decision expected at the latest by beginning of January 2020
- Disk space on hydro:
 - ♦ Eugene will ask Ales and Pavle about their old data
 - ◊ *Ales' data removed (05 Sept 2019), Pavle will come to ETH - date tbd*
 - ♦ Tom will contact Angela
 - ◊ *Angela's data removed (10 Sept 2019)*
 - ♦ Andrea will further clear Ancelin's data and ask Laura about her data
 - ◊ *Laura promised to check her data*
 - ♦ Andrea is now owner of Ales', Angela's and Pavle's data on hydro

Filesystem	Size	Used	Avail	Mount on
/dev	1024	1024	0	/dev
/etc	1024	1024	0	/etc
/home	1024	1024	0	/home
/lib	1024	1024	0	/lib
/lib64	1024	1024	0	/lib64
/media	1024	1024	0	/media
/mnt	1024	1024	0	/mnt
/opt	1024	1024	0	/opt
/root	1024	1024	0	/root
/run	1024	1024	0	/run
/sbin	1024	1024	0	/sbin
/srv	1024	1024	0	/srv
/tmp	1024	1024	0	/tmp
/usr	1024	1024	0	/usr
/usr/local	1024	1024	0	/usr/local
/var	1024	1024	0	/var
/var/log	1024	1024	0	/var/log
/var/mail	1024	1024	0	/var/mail
/var/spool	1024	1024	0	/var/spool
/var/tmp	1024	1024	0	/var/tmp
/vmlinuz	1024	1024	0	/vmlinuz
/vmlinuz.old	1024	1024	0	/vmlinuz.old
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/vmlinuz.old72	1024	1024	0	/vmlinuz.old72
/vmlinuz.old73	1024	1024	0	/vmlinuz.old73
/vmlinuz.old74	1024	1024	0	/vmlinuz.old74
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/vmlinuz.old99	1024	1024	0	/vmlinuz.old99
/vmlinuz.old100	1024	1024	0	/vmlinuz.old100

SOCOL day 27 August 2019, PMOD Davos

- Notes
- Presentations: Ari, Arseniy, Andrea, Gabriel, Timofei

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