3rd TM5 Steering Committee Telecon
13 May 2014, 15:30-17:00 hrs

Attending: Maarten Krol, Folkert Boersma, Twan van Noije, Philippe Le Sager, Wouter Peters, Maria Kanakidou, Souresh Basu (SB, for Andy Jacobson), and Peter Bergamaschi

1. Notes 2nd TM5 SC Meeting
The notes of the previous meeting (November 2013) are ready to go online.

2. Development Team status
The discussion focused on differences between the TM5 code in the subversion (SVN) system and the 4D-Var applications using Mercurial (HG), which allows for easier merging of code developments. PLS proposed to keep TM5 under SVN for the time being, as the code needs to be cleaned up first, before going to HG under sourceforge. Use TM5-MP as an opportunity for a gradual transition. PLS will refactor the MP code to remove the repetition of branch/trunk/release directories throughout the repository. The python code will be in one bin, and the sources directly below each project dir. A plan for the new structure has been posted for discussion on TM5 portal on sourceforge:
https://sourceforge.net/p/tm5/discussion/tm5mp/thread/64f6dfc0/?limit=25#1689

3. Towards a TM5-mp based release
There have been substantial developments towards TM5-mp, and PLS has successfully installed and tested TM5-mp on parallel platforms, including ECMWF, KNMI Bull, and KNMI Tropomi systems. The performance of the model with full chemistry (but no M7 aerosols) at 1° x 1° and 60 layers is now that it simulates a full month in 5h50mn (IBM@ECMWF, 90 cores), 8h (BULL@KNMI, 36 cores) or 20 hours (an old blade@KNMI, 28 cores). That's about 12 to 40 minutes per day.

Status action items:
- Heterogeneous uptake of HO_2 on aerosols has been implemented, but not yet for HO_2 uptake in clouds pending acceptance of the manuscript by Huijnen et al. in ACP. Cloud uptake coefficient of 0.06 was criticized. MK agreed to discuss Huijnen's ACP paper with Maria and come up with recommendations for further improvements. Actions 1.1 and 1.4 still open.
- Impact CB05 on CO budget still to be investigated. Nikos will provide his latest budgets for CO, to evaluate primary and secondary source. Actions 1.2-1.3 still open.
- REAS 2.1 emissions have been implemented by JW/PLS but only the code for MACC-City is on the SVN. Action 1.5 open.
- JW and Willem Verstraeten are investigating recently updated reaction rates for NOx-losses funded by TROPOMI and QA4ECV projects. Action 1.6 closed.
- EI convective fluxes are now implemented in the model and have been tested by PLS. They are available for 1979-2013 in hdf format. Action 1.7 closed.
- 4D-Var source code will be made open but not advertised. Action 1.8 closed.
- The wet removal of aerosol remains troublesome. TvN and MK will look into it before the next meeting, possibly with the help of their new Ph.D-student. Alternative is too look at how GEOS-Chem is simulating this. Action 1.9 still open therefore.

- Action 10: Does the production of Kz at 1x1 introduce some error when remaping original values from MARS? We should look into it, since it may still be useful to use averaged Kz-values for BL mixing. Still open.

New action items:
- Action 2.1: Nudging of stratospheric O3, HNO3, CO and surface CH4 in TM5-mp is slowing down the model. This requires investigation (MPI communication involved seems to be the problem) and maybe a new strategy (nudge maybe once a day instead of every time step?). Also the ODIN stratospheric climatology (used for CO and HNO3) produces strange results for HNO3 (see http://dev.knmi.nl/issues/152). PLS + JW + FB to look into this.
- Action 2.2: Allowing domain decomposition across longitudes with reduced grid. This is important for EC-Earth, since TM5 currently slows down EC-Earth. WP suggested to go to a Gaussian grid, but that would require conversion of meteo archive. A feasible idea is to do the x-advection for the reduced grid cells on one processor only, regardless of the longitudinal decomposition. It's only for the x-advection, so all the other processes (chemistry, convection, y-advection, etc..) would profit from all the extra cores. The reduced grid is needed to increase the very small timestepping that occurs otherwise at 1x1. PLS to take this up.
- Action 2.3: Implementation of KPP solvers in TM4/TM5 in combination with an adaptive time step for the chemistry. Crete-group group will work on this over the Summer with Maarten + Maria. Note that Vincent Huijnen has a version of CB05 with KPP within C-IFS.
- Action 2.4: Release TM5-mp. The SC decided that TM5-mp will include CB05 instead of CBM-IV (after benchmarking and approval by SC). JW is nearing implementation of CB05. The reduced grid issue (action 2.2) should also be resolved. Once ready, the release will be baptised TM5-mp v1.
- Action 2.5: To investigate if the convective fluxes from OD could be archived by ECMWF. PLS+SB will send email.

4. Wiki and website
MK has done a lot of work on the TM5 website (tm5.sourceforge.net), and this is in good shape now. It presents a picture of the month, and is up-to-date. It serves as an archive for TM5 meeting presentations, notes, and scientific developments of and with the model. Actions 1.11-1.12 closed. It was decided that there should be one person responsible for maintaining the website. Contributions for the website, suggestions for improvements, and updates of scientific papers that have appeared should be sent to that person. For the moment, it is Maarten who is responsible. MK/FB will ask the new PhD-student of FB to take over Maarten's tasks.
It was briefly discussed whether also the KNMI-hosted TM5 WIKI (tm.knmi.nl) should be moved to sourceforge, but the link can be easily found so this was not a priority.

5. Any other business
- PLS is converting the 1979-2014 meteo archive from hdf to netcdf. He is at year 2003 now. We keep both hdf and netcdf for the time being, so older versions of the model can still use the hdf files. For now there is no storage issue. Action 1.13-1.14 still open.
- A possible generic satellite data interface was discussed. Fraught with issues: log-normal space, averaging kernels, spatial representativity. Sharing code

within the TM5-es is always a good idea. ESA greenhouse CCI: harmonize data format.

- Long code-lines: All new fortran code should follow the standard for line length: no longer than 132 characters, since some compilers enforce it and disregard all characters after column 132.
- SB ask if PBL mixing could be done offline for the adjoint.

6. Next ITM5 and SC Meeting

Both meetings are scheduled for 22-23 January 2015 at SRON, Utrecht,

Action item table.

Action #	Title	Responsible	Status
1.1	HO2 uptake	PLS	Open
1.2	CB05 impact on CO	FB	Open
1.3	CO budget in TM5	MK	Open
1.4	HO2 uptake	MK+Maria	Open
1.5	REAS	PLS	Open
1.6		FB	Closed
1.7		SC (Steering Committee)	Closed
1.8		PLS	Closed
1.9	Wet deposition	MK+TvN	Open
1.10	Kz for BL mixing	MK	Open
1.11		MK+FB	Closed
1.12		FB	Closed
1.13	Ongoing meteo processiong	PLS	Open
1.14	Met. archive conversion to nc	PLS	Open
2.1	Nudging issues	PLS+FB	Open
2.2	Reduced grid + longitude decomp.	PLS	Open
2.3	KPP in TM5	MK	Open
2.4	Release TM5-mp v1	PLS+SC	Open
2.5	Convective flux from OD	PLS	Open