Project: **677**
Project title: **Evaluierung der Atmosphaerenchemie in MECO(n)**
Project lead: **Astrid Kerkweg**
Report period: **2017-01-01 to 2017-12-31**

The activity plan for this project for the year 2017 was split into six parts:

1. (TS) Test simulations: upgrade to a COSMO version with unified COSMO-ICON physics package. Testing / Tuning of new turbulence scheme to improve tracer transport in boundary layer.
2. (SVAT) Implementation of the “Community Land Model” (SVAT-CLM) as a COSMO/MESSy submodel
3. (COMP) Comparison of the performance of COSMO/MESSy including SVAT-CLM with the COSMO-CLM^2
4. (IM) ICON/MESSy development
5. (FOGDEV): implementation of the PAFOG model into COSMO/MESSy
6. (FOGTUN): Parameter Tuning (especially turbulence scheme) of the COSMO-PAFOG model

Five of the six workpackages (1-3 and 5-6) depend on the availability of the new COSMO model version including the new turbulence scheme by M. Raschendorfer.

Unfortunately, the German Weather Service could still not provide a stable COSMO model version including the new unified ICON-COSMO physics package. Thus the development work and tests proposed for 2017 need to be shifted to 2018.

Technically, in 2017 COSMO/MESSy has been adapted to the new blocked structure of the ICON-COSMO physics package. But until a stable version is available, further tests with respect to the tracer transport in the boundary layer are meaningless.

[4. IM] In the context of the ICON/MESSy development the MESSy submodel IMPORT was implemented into ICON/MESSy. Here, the biggest challenge was the inclusion of non-rectangular-structured grids (as used in ICON and CESM1).

Figure 1 shows examplarily for SO2 offline emissions, the remapped data to alle available MESSy basemodels. Additionally, the TRACER infrastructure submodel and an expanded TIMER version, enabling independent time stepping in all ICON patches have been implemented.

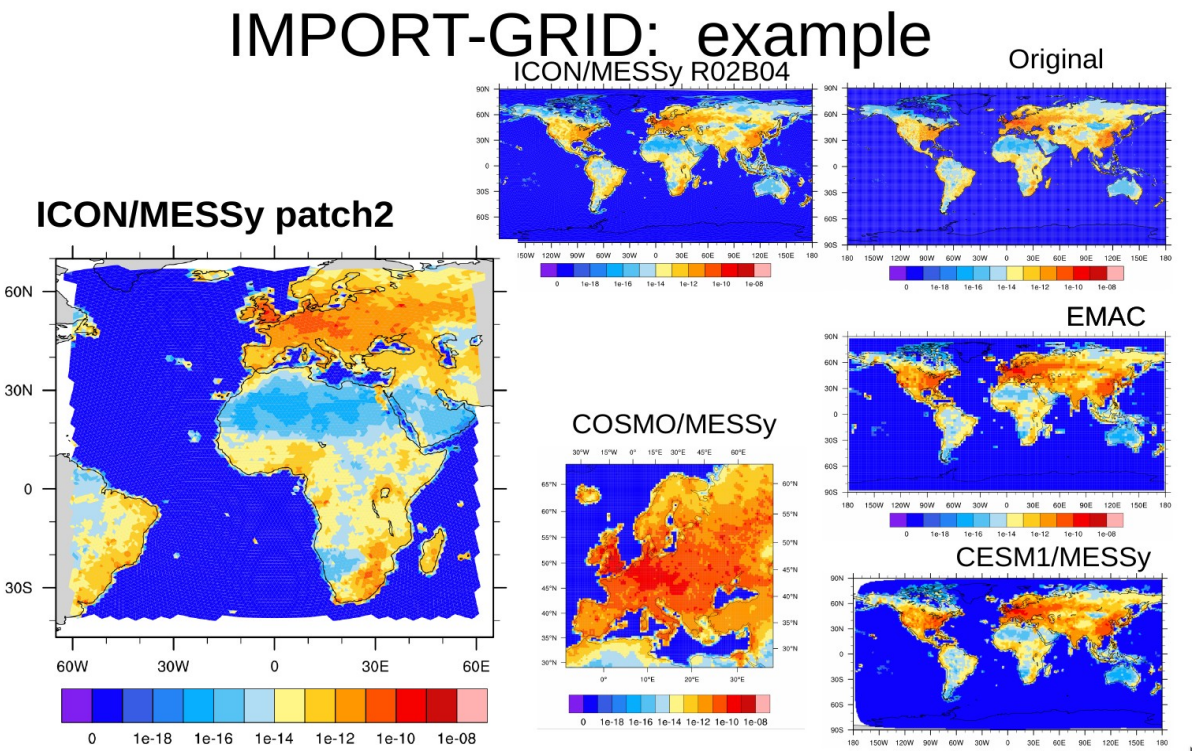

Fig. 1: Example offline SO2 emissions remapped to all available MESSy basemodels: upper right panel: original data, upper left panel: ICON global patch, left panel: ICON patch R02B05, middle panel: COSMO/MESSy, right, middle panel: EMAC, lower right panel: CESM1/MESSy.