

Source Code Management, GRIB2 and the COSMO Spirit

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Last Developments for COSMO 5.0 (INT2LM 2.0)

Version	Date	Contents	Results Changes
C 4.29	02.10.13	• Unification of COSMO/MESSy tracer structure • Added W_SO to list of fields for possible external analysis / perturbations	No
I 1.23	02.10.13	• More GRIB / grib_api adaptations	No
I 1.24=2.0	31.10.13	• Few technical changes	No
C 4.30=5.0	08.11.13	• More GRIB /grib_api adaptations • Few technical changes	No

Developments for COSMO-Model 5.1

- The Scientific Management Committee approved the following contributions for COSMO-Model 5.1
 - Dynamics:
 - Targeted diffusion to avoid cold pools
 - Reformulation of divergence damping coefficients in new FW-solver
 - Adaptation of RK dynamical core to SPPT
 - Changes to Davies-Relaxation
 - Advection and horizontal diffusion of TKE
 - COSMO-ICON Microphysics:
 - Technical framework to copy to / from block data structure
 - Latest changes in Microphysics: cloud ice sedimentation, sticking efficiency and evaporation, supercooled liquid water and reducing freezing rate

Developments for COSMO-Model 5.1

- The Scientific Management Committee approved the following contributions for COSMO-Model 5.1 (cont.)
 - Stochastic Perturbations of Physics Tendencies
 - Changes in the Assimilation:
 - Nudging: technical adaptations for Cray XC30
 - Latent Heat Nudging: adaptations for GRIB2; bug fixes
 - Changes in the I/O (GRIB2 and grib_api)
 - Modifications to read HHL and P from the initial file in GRIB2
 - Modifications because of missing vertical coordinate parameters in GRIB2
 - Modifications because of missing reference atmosphere parameters in GRIB2

Developments for COSMO-Model 5.1

- The Scientific Management Committee approved the following contributions for COSMO-Model 5.1 (cont.)
 - Interface to the Radar Forward Operator EMRADSCOPE
 - Removal of Inconsistencies for the Tracers
 - Single Precision Version
 - Changed nearly all COSMO files: replaced `ireals` by `wp` (or `dp`)
 - Consistent programming: `0.5_wp`, `1.0E-6_wp`
 - Online Trajectory Module

Status of COSMO-Model 5.1

- All developments have been implemented into a beta-version, which has been given back to all contributors for cross-checking and testing (mid of August)
- Expect feedback within the next weeks.
- Plan: Final tests and release until end of September!
- More detailed documentation will be available on the COSMO-Web Page:
<http://www.cosmo-model.org/content/model/releases.htm>

Developments for INT2LM 2.1

- Not yet approved by the Scientific Management Committee:
 - Adaptations for GRIB2 and grib_api according to the COSMO-Model
 - Implementation of ICON $\Rightarrow$ COSMO
 - Implementation of SLEVE2
 - Modified interpolation of soil moisture variable W_SO over glaciers
 - Smoothing and correction of filtered orography (introduced for COSMO-1)
 - Replaced `mpe_io.f90` by `mpe_io2.f90`
 - Several technical adaptations and bug fixes
- Need a new version 2.1 by end of September to distribute to all licence takers for testing!

Changes to the COSMO Standards

- ➔ Chapter 5.3: External product documentation: document external components (as for example the Online Trajectory Module) in a COSMO Technical Report.
- ➔ Chapter 6.1: Included definition of „Recommended CLM-Community Version“
- ➔ Chapter 6.6:
 - ➔ Technical test suite: included short introduction and reference to the COSMO-Web Page, where to get the suite and the documentation.
 - ➔ Meteorological test suite for NWP applications: included short introduction; the test suite itself is described in an extra document.

GRIB2 and grib_api

GRIB2 and grib_api

- grib_api has been implemented in the COSMO-Model 5.0 and INT2LM 2.0
- It can be used to process GRIB1 and GRIB2
- Usage of new general vertical coordinate in GRIB2 required additional modifications to run a smooth operational forecast system.
 - Problem: Vertical coordinate parameters and reference atmosphere parameters are not available anymore in GRIB2 meta data.
 - Changes are contained in COSMO-Model 5.1 and INT2LM 2.1 (see WG6 presentation: [GRIB2 implementation and its usage in the COSMO-Model system](#))
- Work left to do:
 - Detailed documentation in the User Guides and on the Web.
 - Testing usage of grib_api for ncenter $\neq$ 78 (i.e. other than DWD): because local definition files are needed for grib_api to interpret special GRIB meta data

Regarding Usage of GRIB(2)

- GRIB2 (and grib_api) do allow local use for some parts of the meta data
 - Local use section
 - local use of product identifying keys (e.g. `generalProcessIdentifier`, `productionStatusOfProcessedData`)
- A [GRIB 2 common COSMO policy](#) has been set up by the TAG to better coordinate the GRIB 2 usage between our centers.
- Problem:
 - A documentation of the grib_api definition files and its usage is missing!

The COSMO Spirit

and why we all cannot wait until the next General Meeting

See you next year





Thank you
very much
for your
attention