Deutscher Wetterdienst
Wetter und Klima aus einer Hand

News from COSMO and ICON

CONSORTIUM FOR SMALL SCALE MODELING

COSMO

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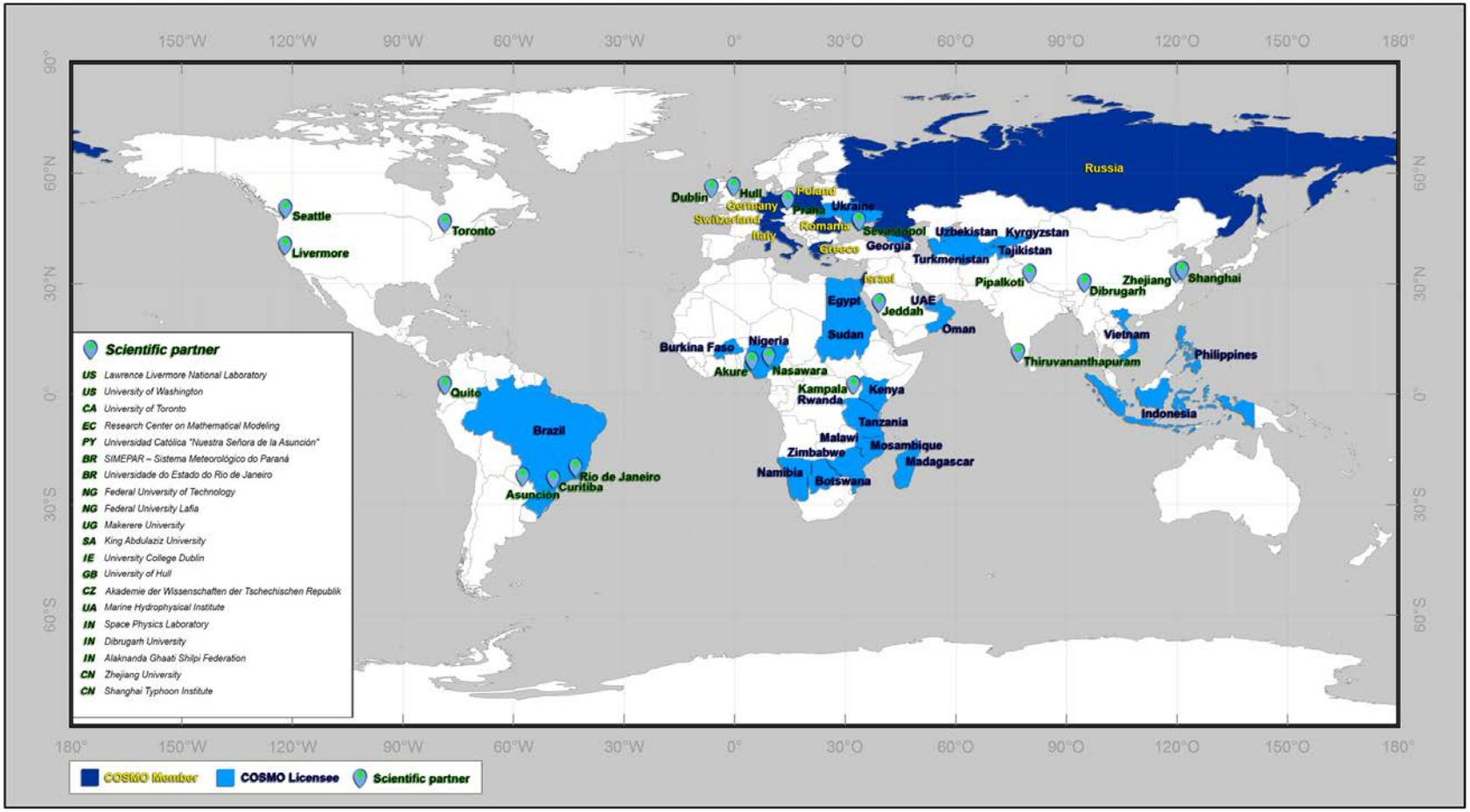
Overview COSMO

- Current Steering Committee Chairman: Andrzej Wyszogrodzki (IMGW)
- Scientific Project Manager: Dmitrii Mironov (DWD)



Overview COSMO

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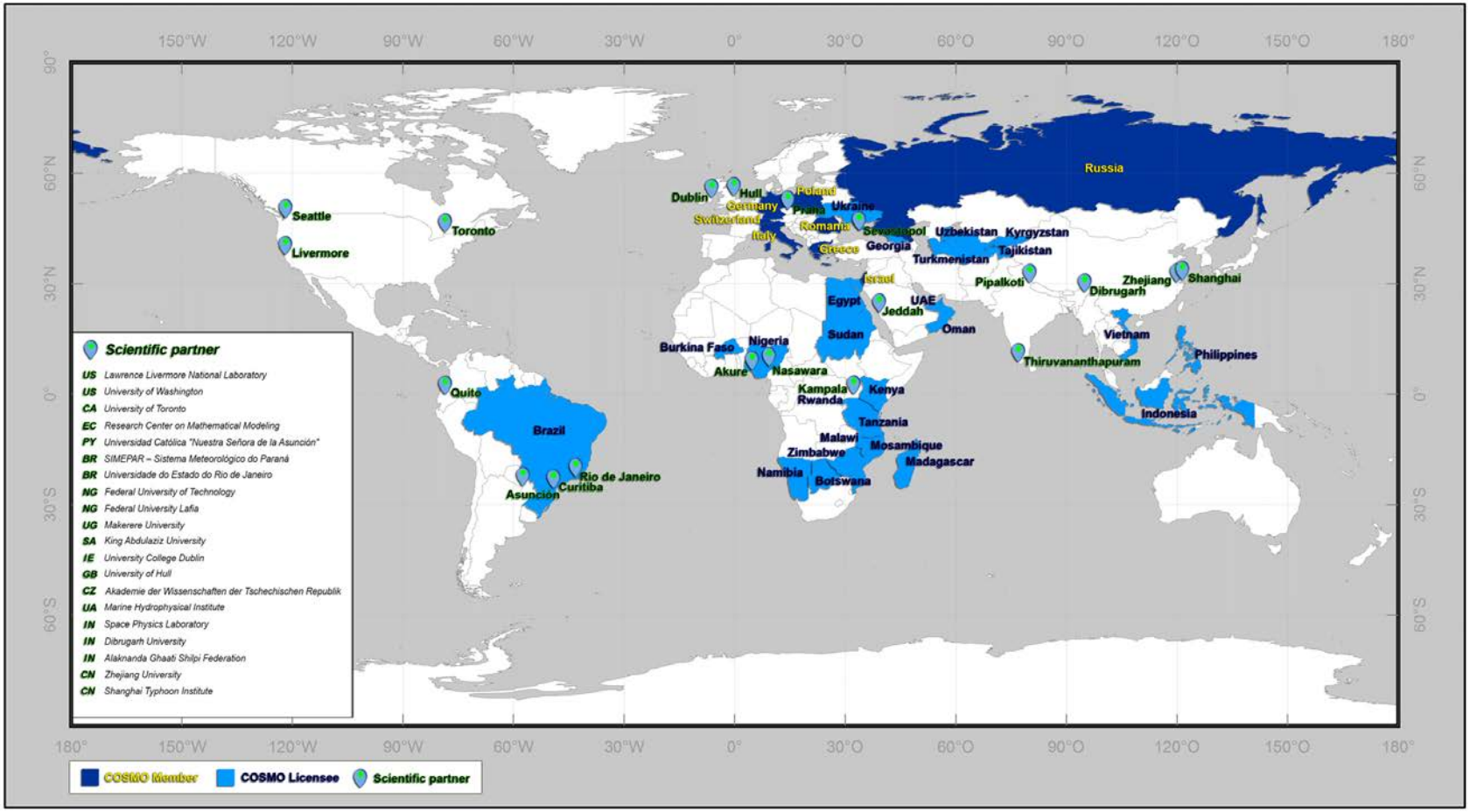
- New Steering Committee Chairman: Lucio Torrisi (COMET)
- Scientific Project Manager: Dmitrii Mironov (DWD)



Versions Implemented since Sep. 2017

Version	Date	Contents (Highlights)	Results Changes
5.04f	01.09.17	• additional modifications to COSMO-ICON physics (new namelists, bug fixes, GPU version of TERRA)	yes
		• Possibility to reproduce behaviour of old turbulence scheme (not TERRA!)	yes
		• changes in data assimilation	eventually
		• new diagnostic output to highlight convective cell tracks (for ESSL testbed)	no
		• changes in handling statistically processed fields (min, max, avg, sums)	no
		• possibility to use RTTOV12	SynSat

Please read more about the changes in the Release Notes for the different versions.

Versions Implemented since Sep. 2017

Version	Date	Contents (Highlights)	Results Changes
5.04g	13.11.17	• Reproducing behaviour of old physics • Updated TERRA to latest ICON version • GPU port for Tiedtke scheme • Modified computation of HPBL • Modifications to SPPT	yes yes no HPBL lsppt=.T.

Versions Implemented since Sep. 2017

Version	Date	Contents (Highlights)	Results Changes
5.04h	15.12.17	• Data assimilation: processing of AMV • Dynamics: halo treatment of tt_lheat • Physics: lshallowconv_only for Tiedtke-Bechtold • GPU port of Turbulence	if used yes no no

Versions Implemented since Sep. 2017

Version	Date	Contents (Highlights)	Results Changes
5.05	23.02.18	• Porting additional parts to GPU • GCL communication library for GPU • Optimization of global communication in latent heat nudging • New option for targeted cold pool diffusion	no no no if used

02.08.18: Implemented a bug fix in turb_transfer.f90 in patch version 5.05_1

Plans for future versions

Version	Date	Contents (Highlights)	Results Changes
5.05a	22.06.18	• Dynamics: 2nd order Bott scheme together with deformational correction method • Porting additional parts to GPU: diagnostics, output • Changes to prepare implementation of Radar Forward Operator	if used no no

21.07.18: Implemented the bug fix in turb_transfer.f90 in patch version 5.05a_1

DWD only, not yet distributed to COSMO

Plans for future versions

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Version 5.06 (February 2019)

- ➔ POMPA: Port of Assimilation and LHN (already in 2018) 5.05b
- ➔ Radar forward operator (EMVORADO) (hopefully, in 2018) 5.05c
  - ➔ still needs some technical clean up and documentation
  - ➔ tests at DWD are ongoing
- ➔ Higher order horizontal discretizations (by end of 2018) 5.05d
  - ➔ already available; see plans by WG 2

Version 6.0 (December 2019 at latest)

- ➔ Urban module: tests in PT AEVUS are ongoing (see updated PT plan)
- ➔ Mire parameterization (optional)
- ➔ Unification with CLM Version (work in progress)

INT2LM 2.05

The release INT2LM 2.05 was distributed recently!

- Most changes by Uli Blahak were already presented last year:
  - Option to only process COSMO external parameters
  - Kinne and CAMS aerosol fields (T2RC2)
  - New methods of adapting vertical profile to new orography
  - Profiles of w blended to “terrain-following” values
  - Hydrostatically balanced pressure computed instead of interpolated
  - Bugfixes for T_SO

INT2LM 2.05

Changes in the meantime (part of 2.05)

- **UUID check of vertical grid**
  ICONSUB is now able to properly set uuidOfHGrid and also uuidOfVGrid. For the vertical grid, small modifications were necessary. UUIDs should be checked in the future!
- **ecCodes**
  Modifications for eccodes to get a proper interpretation of indicatorOfUnitOfTimeRange and stepUnits.

INT2LM 2.05

Changes in the meantime (part of 2.05)

- **ICON-ART mineral dust**
  Interpolation of additional dust fields (ncdf or grb2) to be used to calculate optical properties in COSMO (part of T2RC2).
- **Bugfixes**
  - **Combination of GME and GRIB1**
    A character length was inconsistent between int2lm and libgribdwd.

COSMO Priority Projects and Tasks

- Research & Development contributions of COSMO members are organized in
  - Priority Projects (PP, typical duration 3 to 4 years)
  - Priority Tasks (PT, short term, ~1 year)

- PP and PT overview provides also an overview of current scientific and development activities within COSMO

- Detailed PP & PT plans are available on COSMO web page

  www.cosmo-model.org

Ongoing Priority Projects

PP KENDA-O (led by Christoph Schraff, until Aug 2020)

➔ Km-scale ENsemble-based Data Assimilation for high-resolution Observations

PP CDIC (led by Michael Baldauf, until end of 2018)

➔ Comparison of the dynamical cores of ICON and COSMO

PP T2(RC)2 Phase 2 (led by Harel Muskatel, until Sep 2019)

➔ Testing and Tuning of Revised Cloud Radiation Coupling

PP CALMO-MAX (led by Antigoni Voudouri, until Sep 2019)

➔ CALMO Methodology Applied on eXtremes

Ongoing Priority Projects

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PP C2I (led by Daniel Rieger, until Mar 2022)

➔ Transition of COSMO to ICON-LAM

PP EX-CELO (led by Zbigniew Piotrowski, until Sep 2019)

➔ Extension of COSMO-EULAG operationalization

PP CEL-ACCEL (led by Zbigniew Piotrowski, until Sep 2019)

➔ COSMO-EULAG on accelerators

PP APSU (led by Chiara Marsigli, until Aug 2020)

➔ Ameliorating Perturbation Strategy and Usage of ensemble systems

Ongoing Priority Tasks

PT AEVUS (led by Paola Mercogliano, until Jun 2019)

➔ Analysis and evaluation of TERRA_URB Scheme

PT SAINT (led by Sascha Bellaire, until Jun 2019)

➔ Snowcover Atmosphere INTeractions

PT TERRA Nova (led by Yiftach Ziv, until Aug 2018)

➔ TERRA: Testing the new version of the soil module

PT CIAO (led by Andrea Montani, until Dec 2018)

➔ implementation of the Bechtold Convection scheme In the model: deterministic And ensemble-mOde tests

New Priority Projects & Tasks

PP IMPACT (led by Carlos Osuna)

➔ Icon on Massively Parallel ArchiteCTures

PP CARMA (led by Amalia Iriza-Burca)

➔ Common Area with Rfdbk/MEC Application

PT CCE (led by Damian Wójcik)

➔ Consolidation of COSMO EULAG

PP C2I Participating Institutions

- National meteorological services of the COSMO member states:

  MCH (Switzerland), **COMET** (Italy), **HNMS** (Greece), **IMGW** (Poland), **NMA** (Romania), **RHM** (Russia), **IMS** (Israel)

- Other major COSMO members:

  ARPAE (Italy), **ARPA Piemonte** (Italy), **CIRA** (Italy)

- Academic communities:

  CLM Community, **ART**

- National meteorological services (licensees):

  INMET (Brasil)

PP C2I Timeline

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DWD

Phase 1

- ICON Training 2018
- Installation
- Setup
- First experiments

Q2 2018 – Q4 2018

Phase 2

- Daily forecasts
- Verification

Q1 2019 – Q2 2020

Phase 3

- Daily forecasts
- Verification
- Data assimilation
- Forecasters' feedback

Q3 2020 – Q4 2021

18 – 22 March 2019