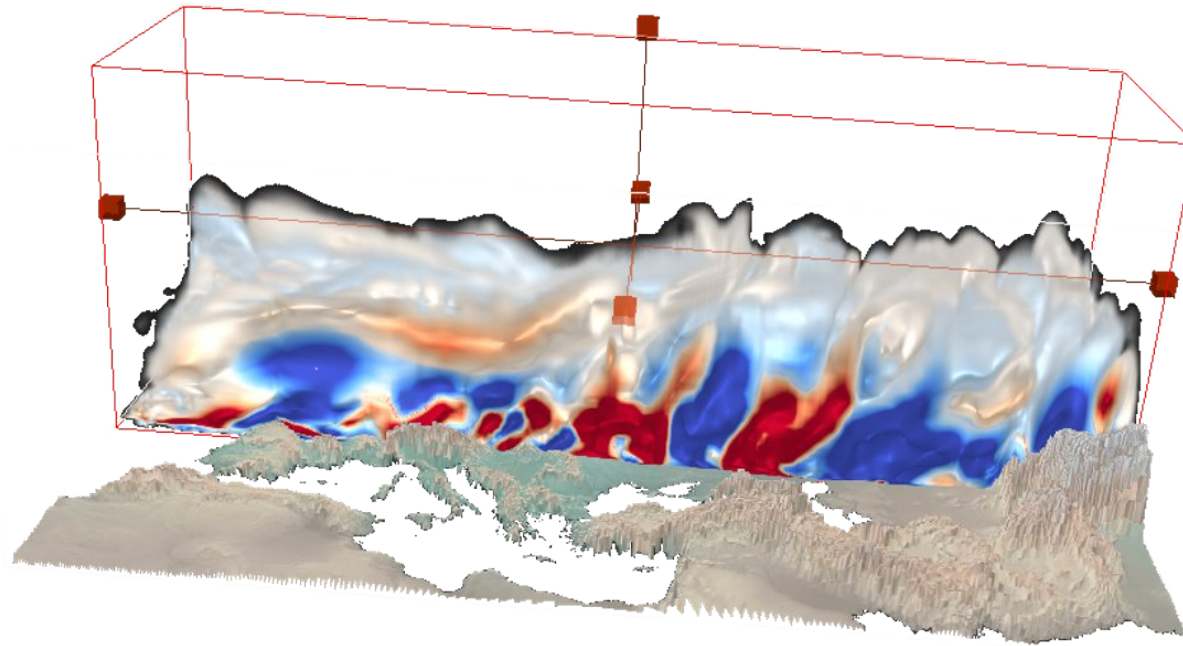
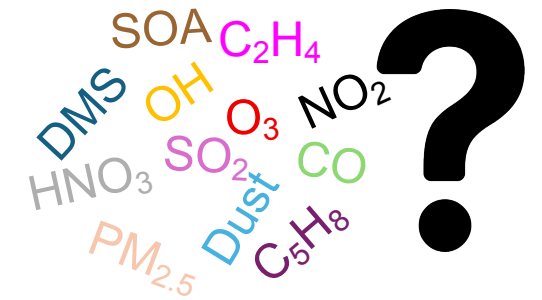




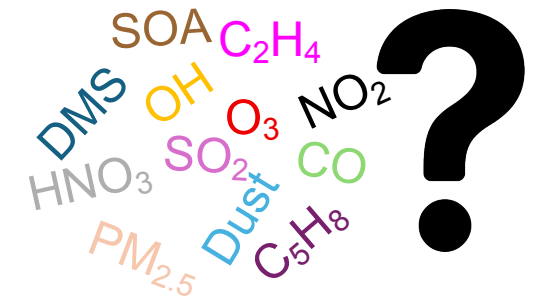
Arineh Cholakian
on behalf of the CHIMERE development team

An overview of the CHIMERE model, validation and next version

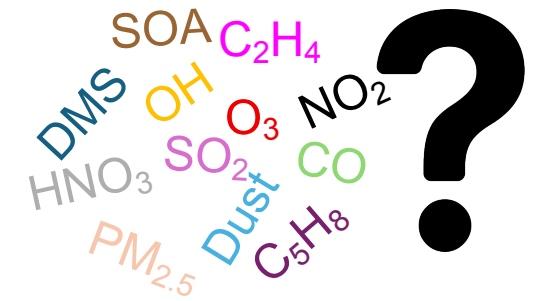
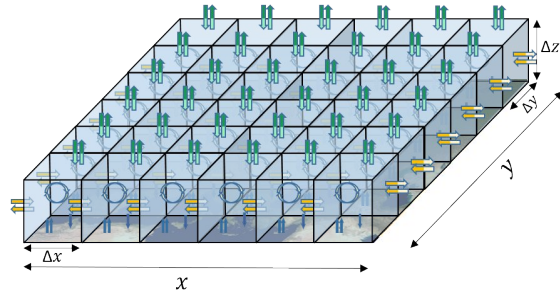
Atmospheric regional modeling



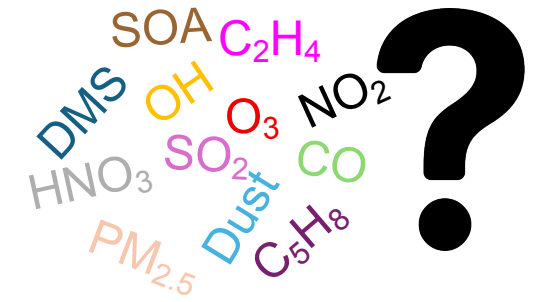
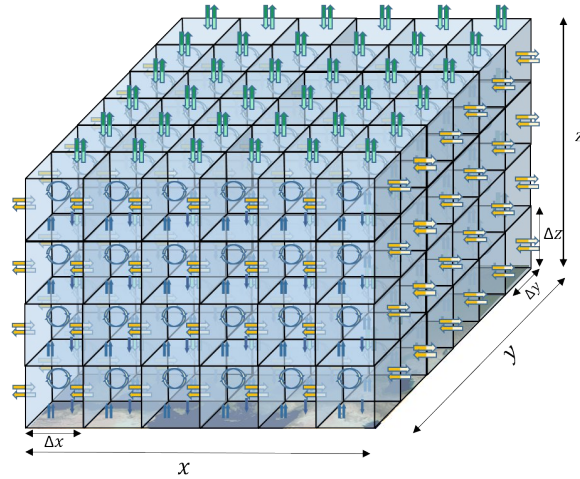
Atmospheric regional modeling



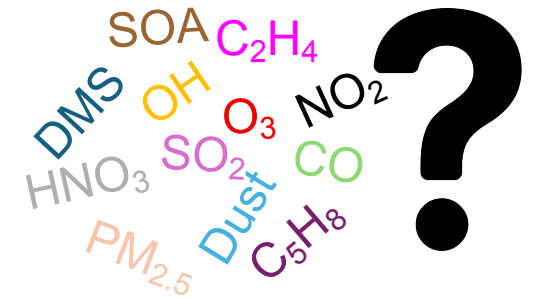
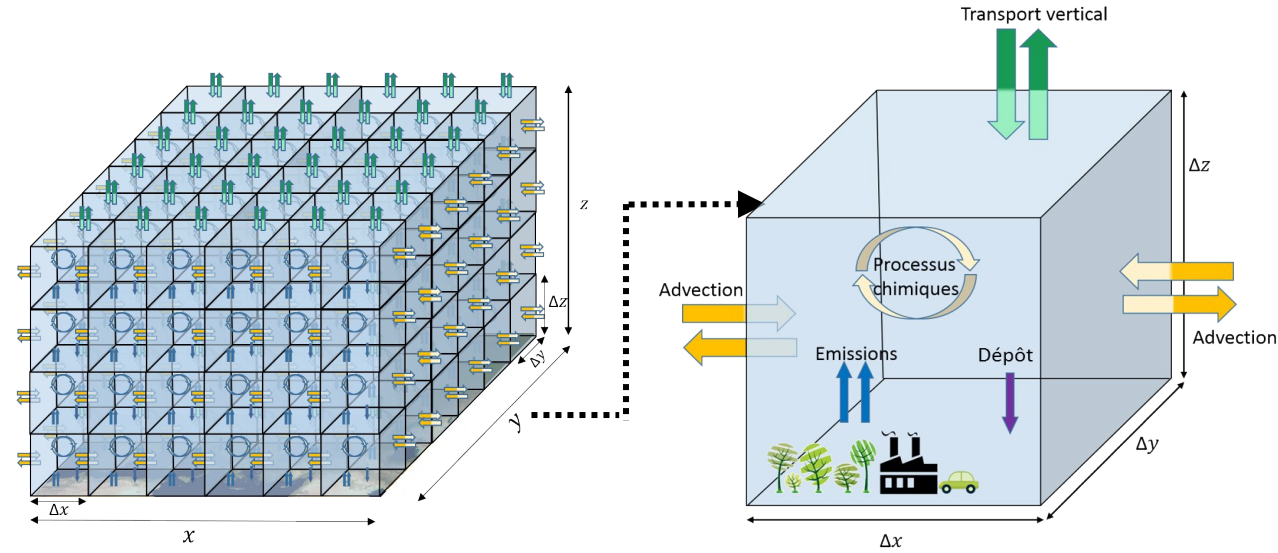
Atmospheric regional modeling



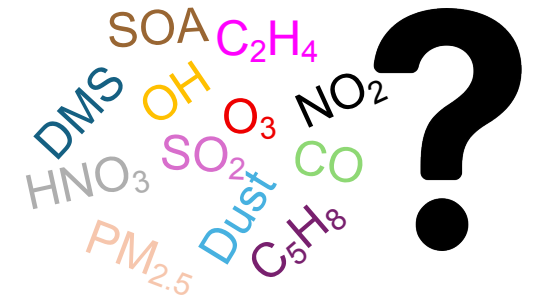
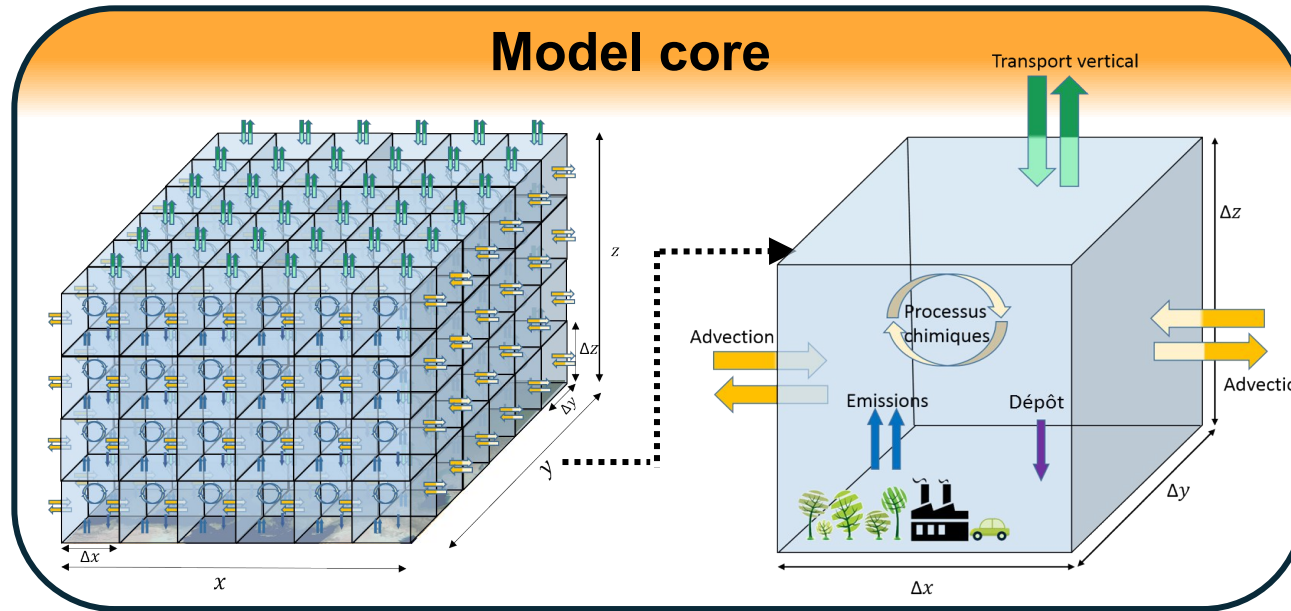
Atmospheric regional modeling



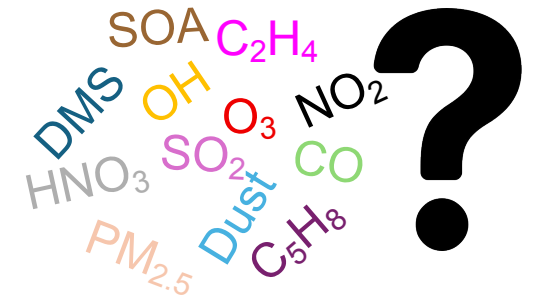
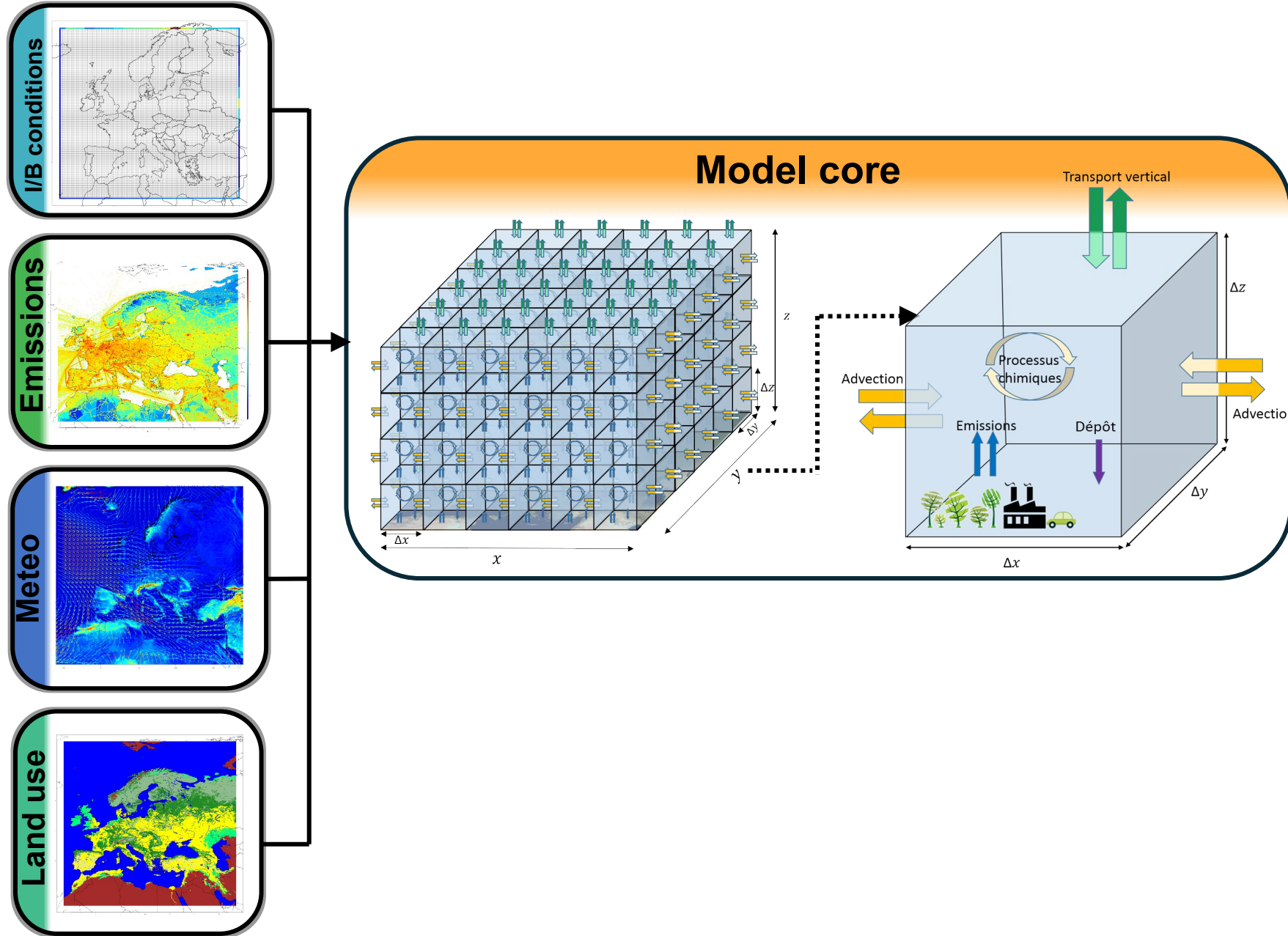
Atmospheric regional modeling



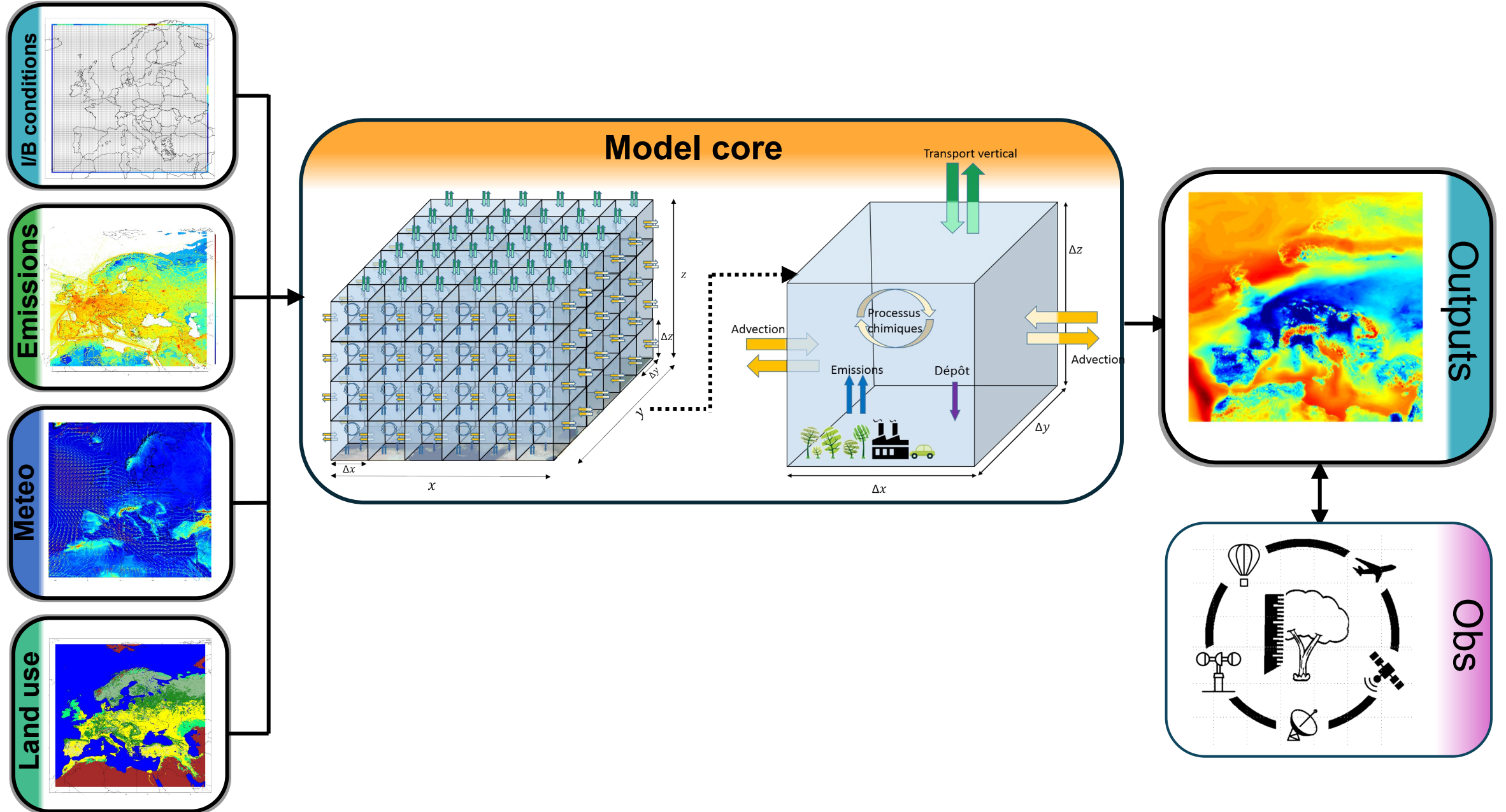
Atmospheric regional modeling



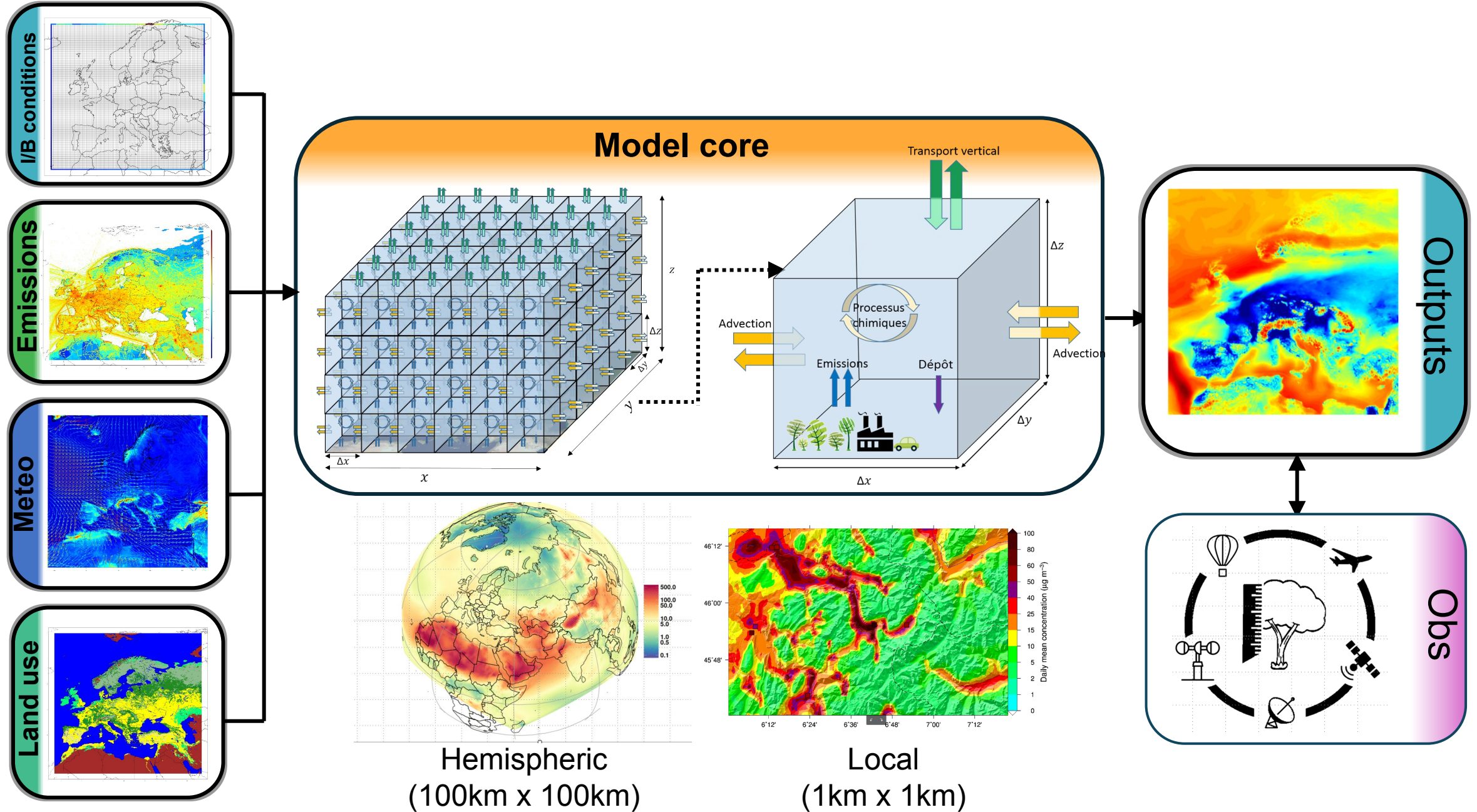
Atmospheric regional modeling



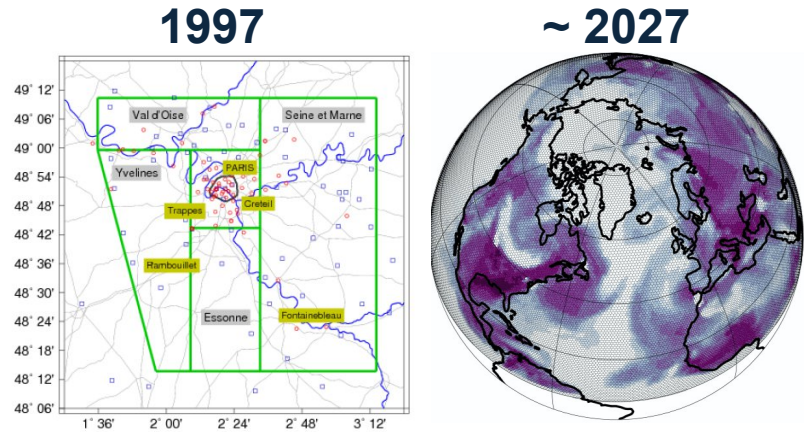
Atmospheric regional modeling



Atmospheric regional modeling



CHIMERE: Who? When? What?

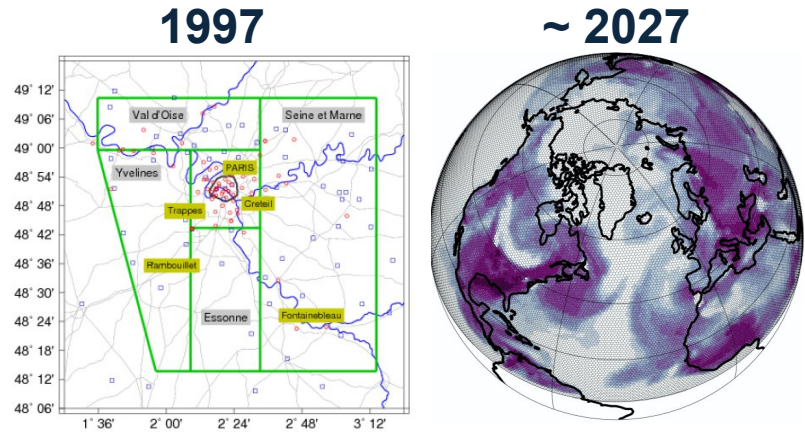


History

Development started in 1998
A national tool since 2007



CHIMERE: Who? When? What?



History

Development started in 1998
A national tool since 2007



Development

7 permanent developers
2 laboratories (LMD/LISA)

BESSAGNET Bertrand
IPSL/LMD
DR CNRS



CHOLAKIAN Arineh
IPSL/LMD (Technical coordination)
CNRS Research Engineer



MAILLER Sylvain
IPSL/LMD
IPEF



MENUT Laurent
IPSL/LMD
DR CNRS



PENNEL Romain
IPSL/LMD
Polytechnique Research Engineer



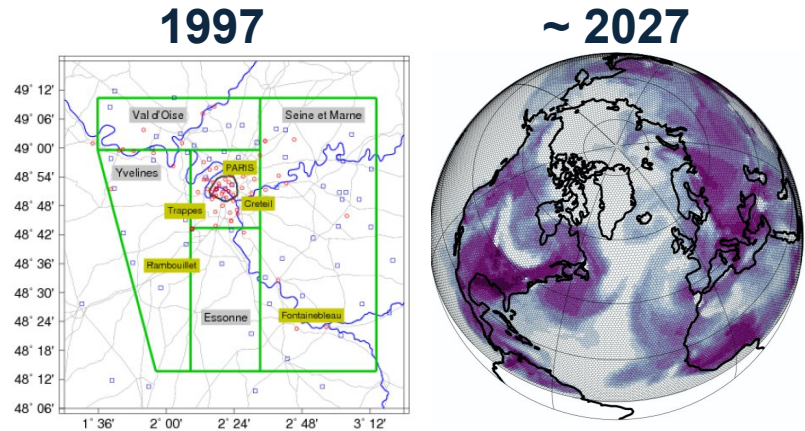
SIOUR Guillaume
IPSL/LISA (model coordination)
CNRS Research Engineer



VALARI Myrto
IPSL/LMD
Assistant Phys. Sorbonne Univ.



CHIMERE: Who? When? What?



History

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A national tool since 2007

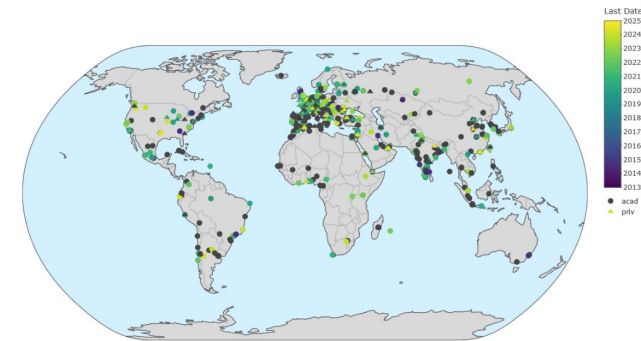
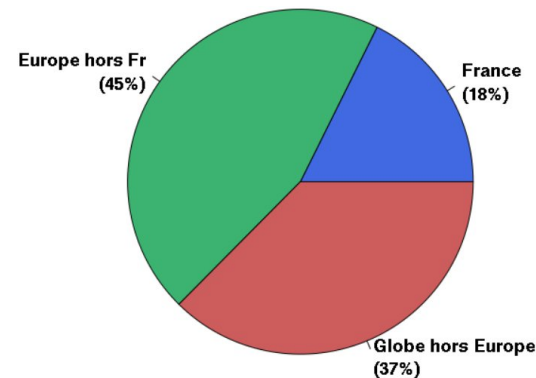


Development

7 permanent developers
2 laboratories (LMD/LISA)

~ 600 users, 120 research institutes
18% in France, 45% in Europe, 37% global

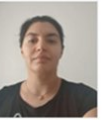
User base



BESSAGNET Bertrand
IPSL/LMD
DR CNRS



CHOLAKIAN Arineh
IPSL/LMD (Technical coordination)
CNRS Research Engineer



MAILLER Sylvain
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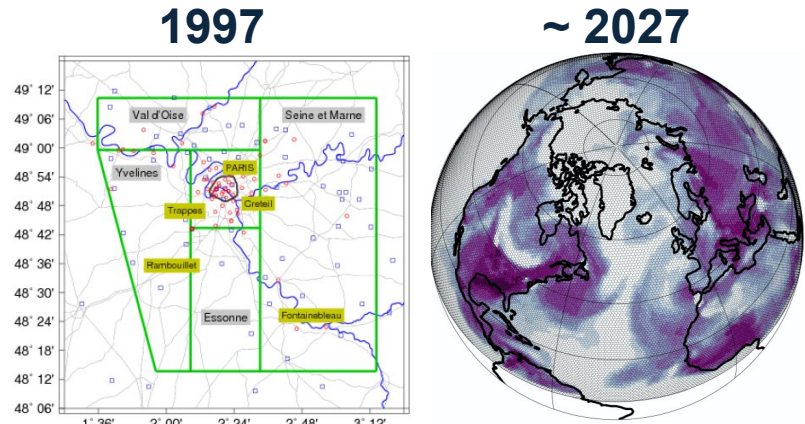
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CHIMERE: Who? When? What?



BESSAGNET Bertrand IPSL/LMD DR CNRS			CHOLAKIAN Arineh IPSL/LMD (Technical coordination) CNRS Research Engineer		
MAILLER Sylvain IPSL/LMD IPEF			MENUT Laurent IPSL/LMD DR CNRS		
PENNEL Romain IPSL/LMD Polytechnique Research Engineer			SIOUR Guillaume IPSL/LISA (model coordination) CNRS Research Engineer		
VALARI Myrto IPSL/LMD Assistant Phys. Sorbonne Univ.					

History

Development started in 1998
A national tool since 2007

Scientific research
Prevision: France, Belgique, Europe, ...

Usage

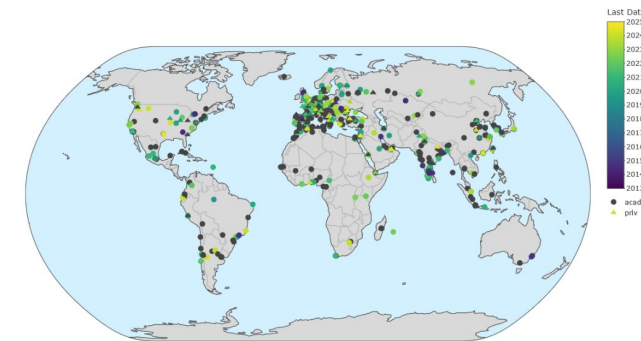
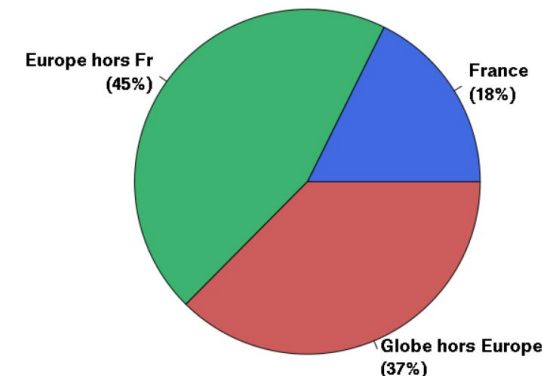
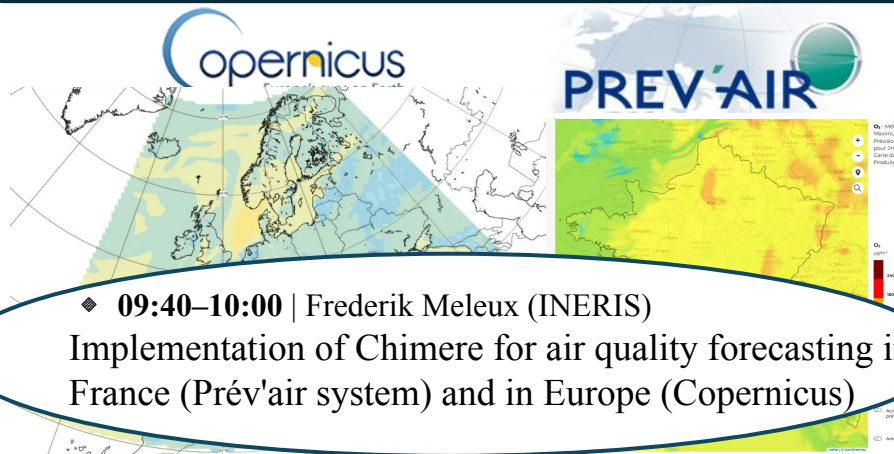


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User base



CHIMERE2023: Downloads, versions

Model availability:

<https://www.lmd.polytechnique.fr/chimere>

<https://www.lmd.polytechnique.fr/chimere/CW-known-issues.php>

In case of questions:

chimere@lmd.ipsl.fr

chimere-users@lmd.ipsl.fr

In case of issues:

chimere@lmd.ipsl.fr

In case of development:

chimere@lmd.ipsl.fr

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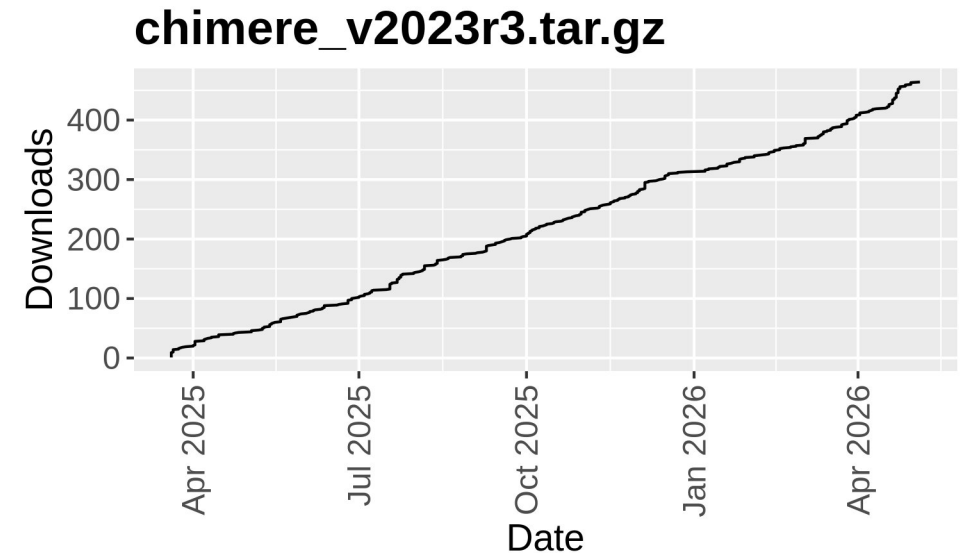
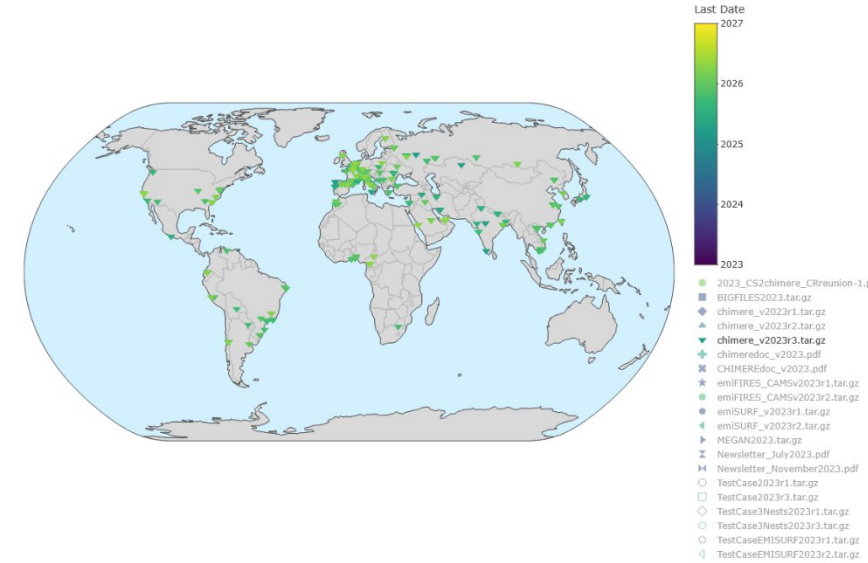
chimere@lmd.ipsl.fr

The Current version:

V2023r1 : December 2023

V2023r2 : July 2024

V2023r3 : March 2025



CHIMERE2023: Downloads, versions

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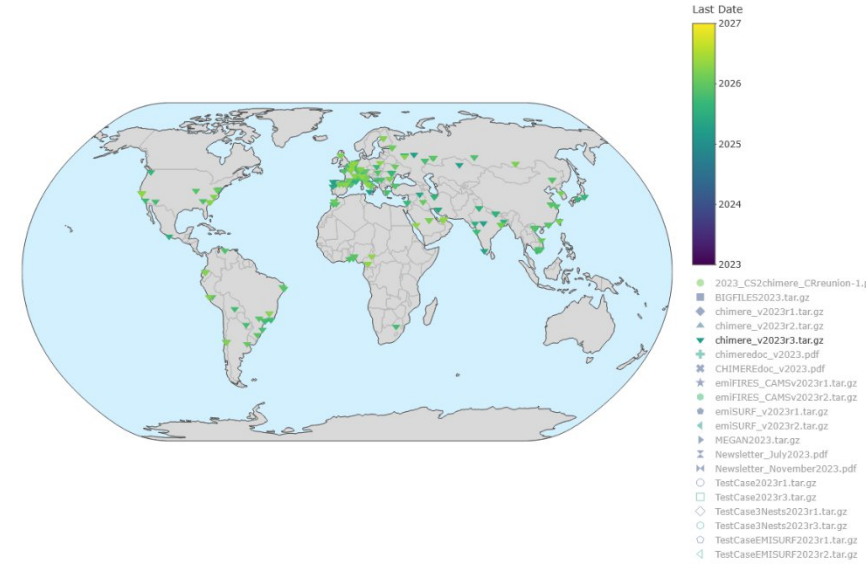
The Current version:

V2023r1 : December 2023

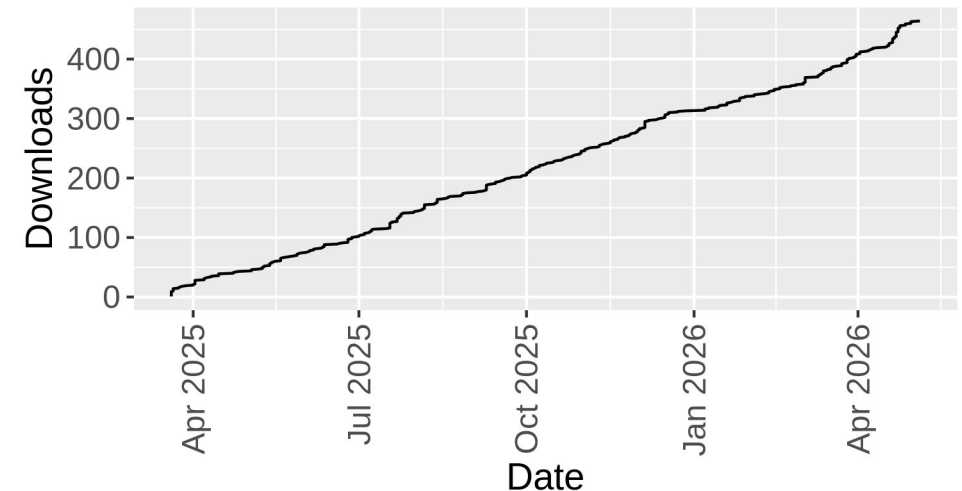
V2023r2 : July 2024

V2023r3 : March 2025

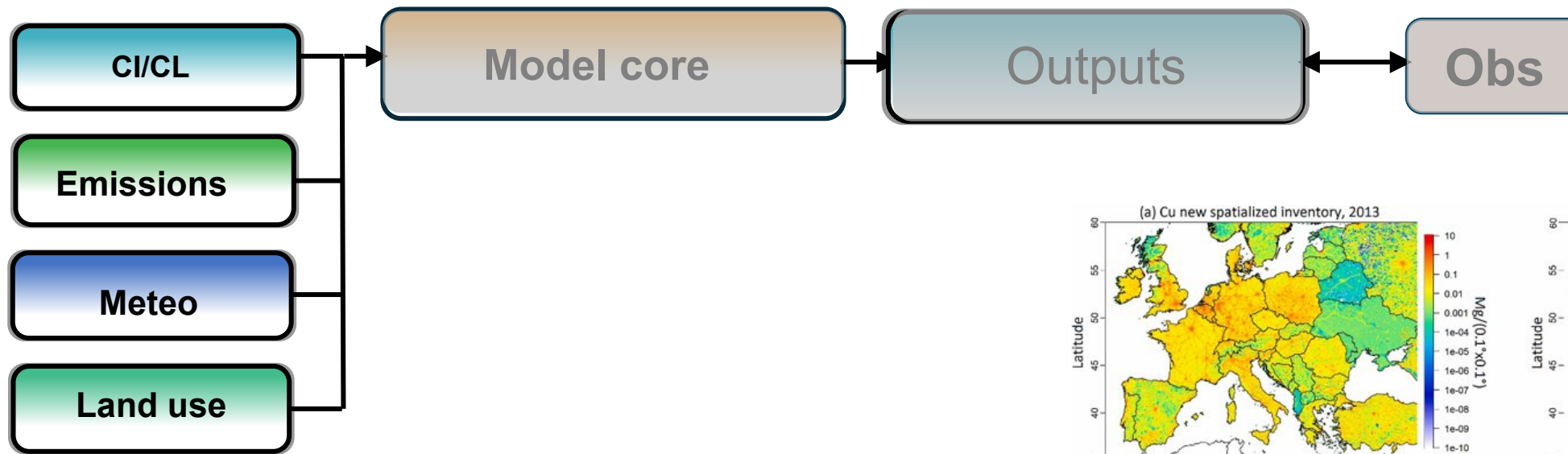
**The Next version:
V2027**



chimere_v2023r3.tar.gz



CHIMERE2027: Development



Emisurf:

- addition of HTAP v3.2 and Edgar
- overhaul of country code handling
- Cu/Fe/Mg emissions for Europe
- CAMS-TEMPO
- openMP parallelization

Biogenic emissions:

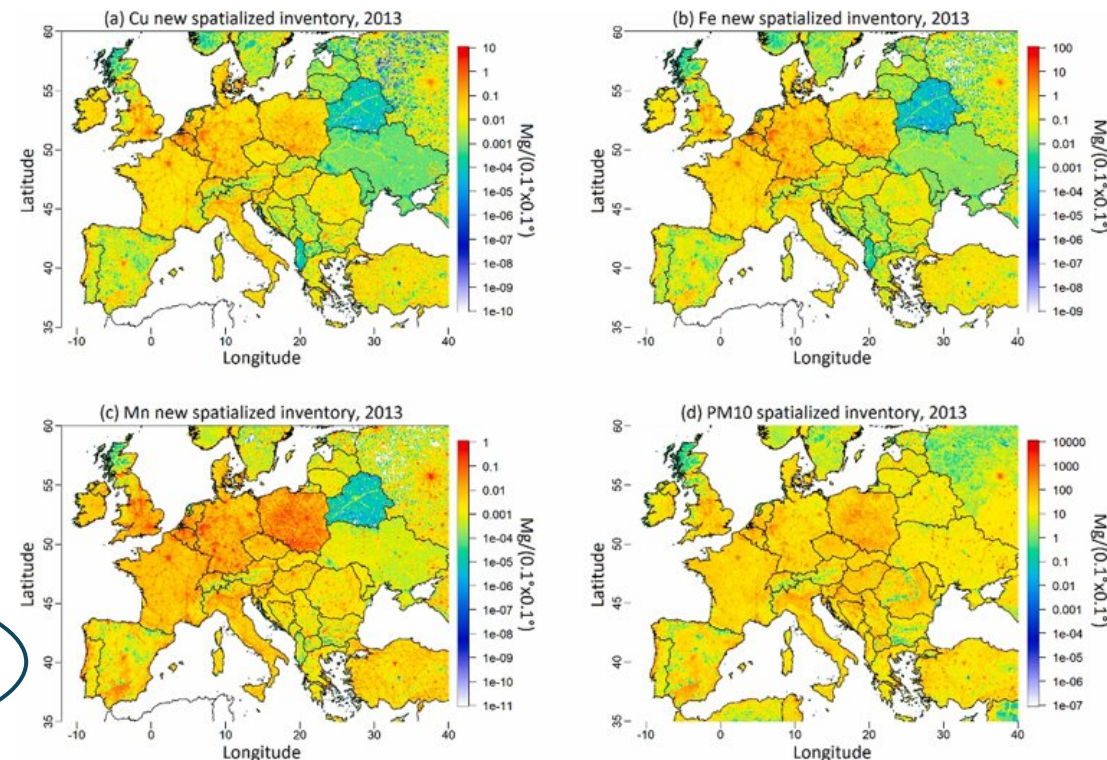
- New LAI (copernicus, MODIS)
- New EF
- fungal spores: Vida et al., 2024

EmifireCAMS: new format of fire emissions

WRF forcing: GFS, CFS, ERA5, IFS

Land use: USGS, GLOBCOVER, GLC, ...

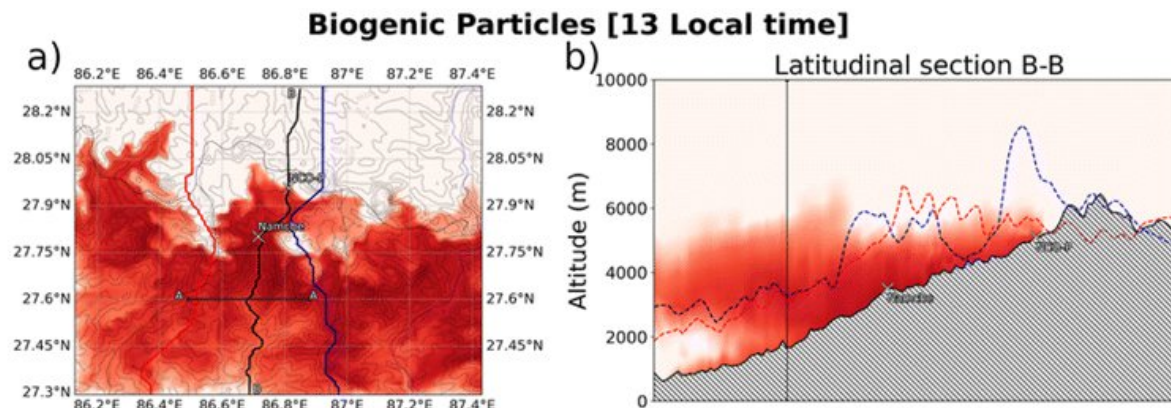
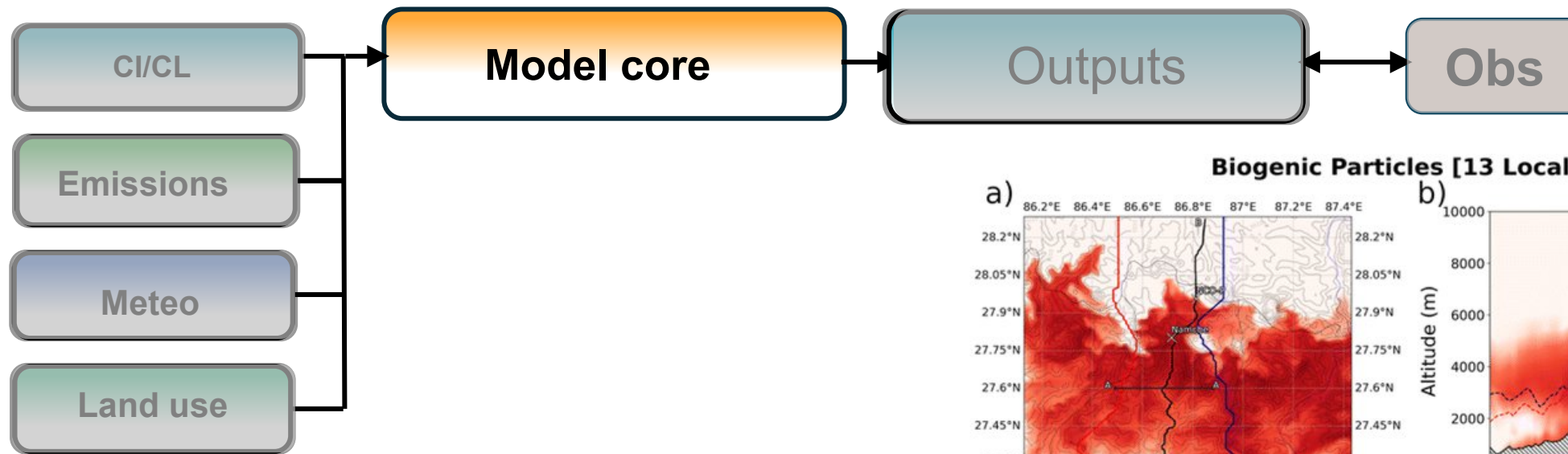
◆ 9:00–9:20 | Arineh Cholakian (LMD)
Biogenic emission factor assessment and
recalculation for metropolitan France



Dubois et al. 2025

◆ 11:40–12:00 | Gilles Foret (LISA/UPEC)
Modélisation multi-échelle des métaux (Cu, Fe, Mn)

CHIMERE2027: Development



New schemes:

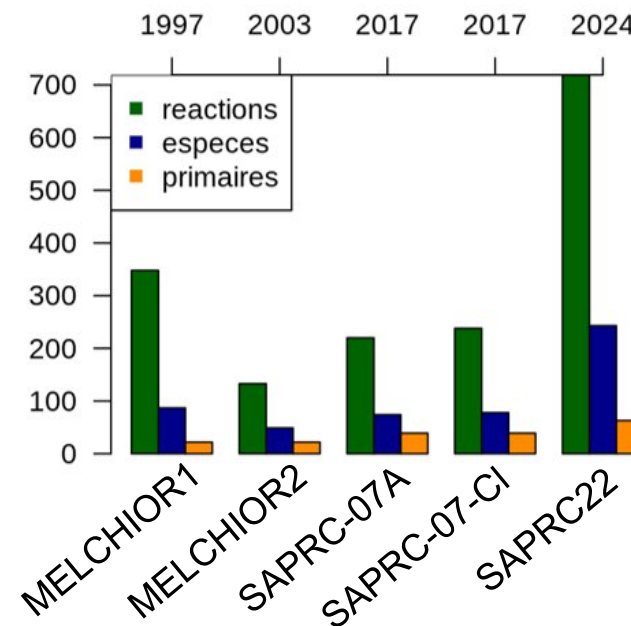
- chemical scheme: SAPRC22, Carter, 2023
- salt emissions: Ovadnevaite et al., 2014/2022
- dry deposition: Pleim et al., 2022
- NO_x lightning emissions: Gosh et al., 2025
- Nucleation: Ciarelli et al., 2025
- Brown carbon handling: Tuccella et al., 2025

Update SSH-Aerosol version

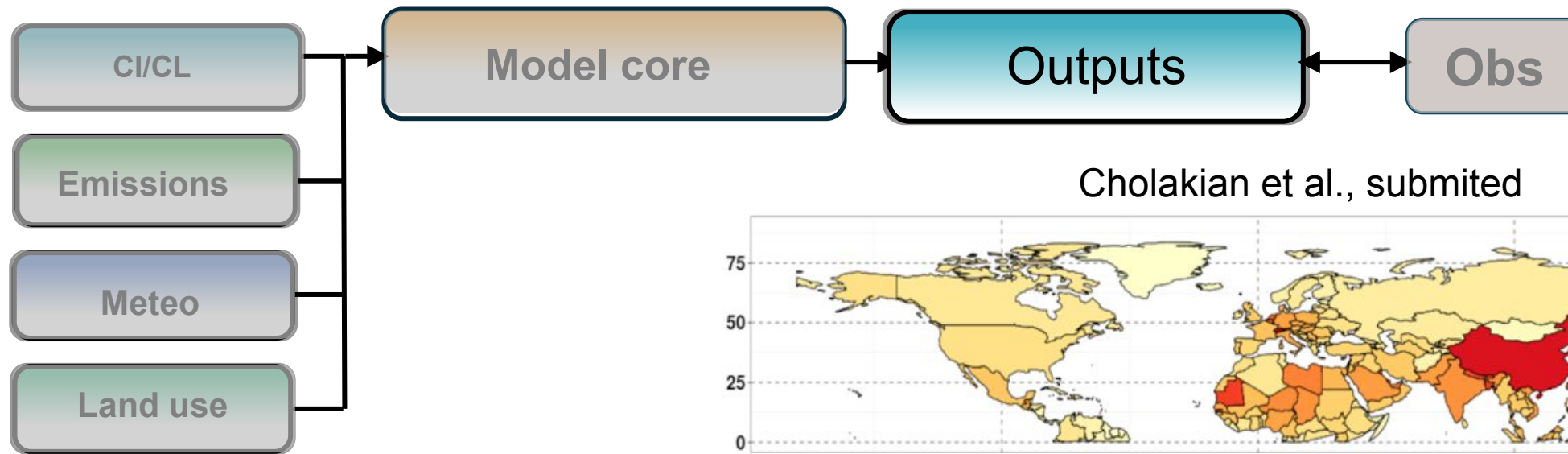
Separation of gas and aerosol concentration tables

+ Other code optimization/modifications

Ciarelli et al., 2025



CHIMERE2027: Development



Population exposure PM_{2.5} - 2005

Vida et al. 2025

Particulate source apportionment: Vida et al., (2025)

Oxidation potentiel calculation: Vida et al., (2025)

Exposure module: Cholakian et al., submitted

Detail source and sink outputs

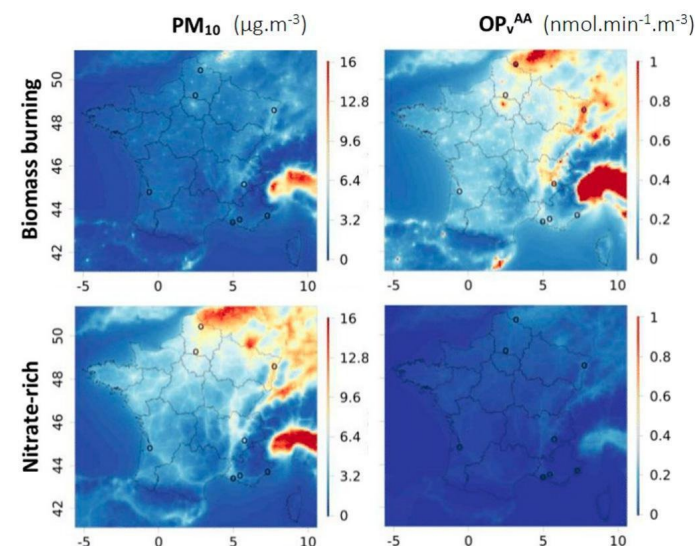
MUNICH coupling

◆ 11:20–11:40 | Yelva Roustan (CEREA)

Two-way coupling CHIMERE-MUNICH

+ Other code optimization/modifications

+ Ongoing developments not mentioned



Simulated OP by source compared to PM₁₀ concentrations

D-CHIMERE: Development

Coupling with Dynamico dynamic core

All processes taken into account now

Only offline meteorological inputs for the
moment



Credit: Romain Pennel

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