JÜLICH Forschungszentrum | JÜLICH SUPERCOMPUTING CENTRE

SIMULATION AND DATA LABORATORY CLIMATE SCIENCE

EARTH SYSTEM SCIENCE ON HPC SYSTEMS

- **Dedicated user support for the Earth system science community**
- **Meteocloud: HPC attached storage leveraging collaborative usage of satellite, reanalysis, and simulation data.**
- **Modelling atmospheric chemistry and dynamics on latest HPC architectures (CLaMS, ECHAM, ICON, MPTRAC)**
- **Radiative transfer and inversion techniques for remote sensing (JURASSIC, RFM, SARTA)**

Expertise

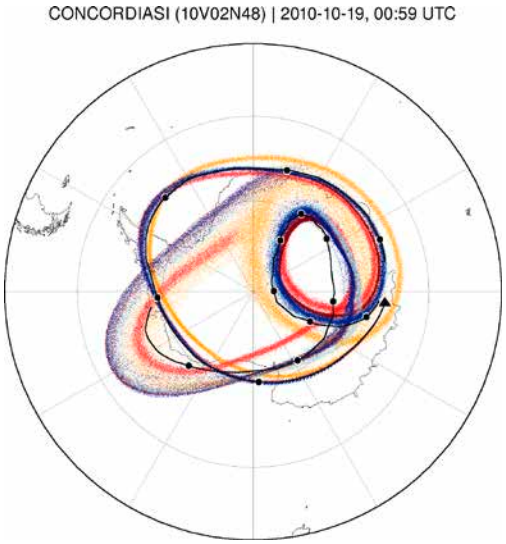
- Inverse modelling
- Radiative transport
- Atmospheric transport
- Atmospheric chemistry
- Aerosol and clouds
- Software development

Research

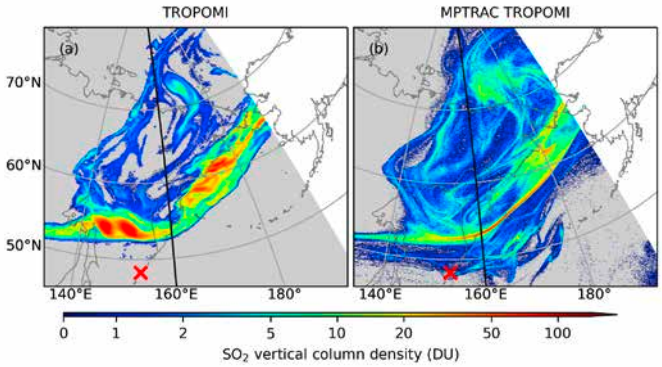
- Lagrangian transport modelling
- IR remote sensing of atmospheric composition and dynamics

Geophysical model development and porting

- ICON
- MPTRAC
- ECHAM/MESSy
- CLaMS
- JURASSIC



Lagrangian trajectories over Antarctica: balloon (black), simulations (colored)



Simulation and Data Science Support

- Mentoring for ESM compute and data projects
- High level support for porting and code optimization
- Jülich Meteocloud: a curated data archive connected to the HPC systems
- 2 PByte observation, model, and comprehensive reanalysis data
- Novel concepts for data analysis and visualization
- Aerosol and clouds
- Software development

Towards Exascale - Co-Design

- Pilot Lab: Dwarf development
- Joint Lab ExaESM
- National ESM Support Team

Collaborations

- FZJ: Atmospheric research institutes
- Helmholtz: Earth & Environment, Aeronautics, Space & Transport
- Germany: DKRZ, Uni Wuppertal, Uni Mainz
- International: NASA, CAS, NERC, ISSI

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