
Governing topics and governing questions

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Photo: Frédéric Batier

The comprehensive research of the institute can be structured along the following governing topics and corresponding governing questions:

Topic 1 - Aerosol processes:

From particle formation to intercontinental propagation

- What are the relevant processes in the tropospheric multiphase system and how are they assigned to natural and anthropogenic regimes?
- What are the effects of anthropogenic and natural emissions, physical and chemical metamorphoses as well as long-range transports on the spatiotemporal variability of the tropospheric aerosol?

Topic 2 : Aerosol-cloud interaction:

From droplet activation to the onset of precipitation

- How can we quantitatively describe aerosol-cloud interaction processes and how can we model those close to reality?
- To what extent does the variability of physical and chemical aerosol properties affect the microphysical and radiative properties of clouds? How important is this influence compared to the variability of the meteorological forcing?

Core competences and methodological foci

The basic strategy of TROPOS is the usage of grown and the development of new core competences, competence fields, and concepts to address scientific questions concerning the process understanding of the tropospheric multiphase system.

Based on this unique feature TROPOS will actively shape the future of tropospheric research. Core competences of the institute are:

- Linkage of experimental and modelling as well as chemical and physical studies
- Development of synergetic concepts in modelling-, field-, and laboratory work towards the understanding of the system "troposphere"
- Development and application of state-of-the-art measurement techniques in one hand
- Characterization of complex aerosol and cloud processes
- Quantitative retrieval of aerosol and cloud properties

- Worldwide missions for aerosol and cloud retrieval in climate relevant key areas and centres of air pollution
- Development of standards in aerosol measurement techniques and in modelling of physical and chemical aerosol processing

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