TROPOS
Leibniz Institute for Tropospheric Research

Process studies on small spatial and temporal scales

Atmospheric Aerosols

TROPOS investigates several of the basic **small-scale processes** occurring with atmospheric aerosols.

On the one hand, we determine the properties of aerosol particles near their source, and examine their emission rates. Our range of interest encompasses **natural** aerosol types like mineral dust, sea spray, volcanic aerosol as well as **anthropogenic** aerosols, such as from domestic, traffic, and industrial sources.

TROPOS examines the **formation** processes of new aerosol particles under both, laboratory and field conditions. This involves nucleation and secondary aerosol formation processes.

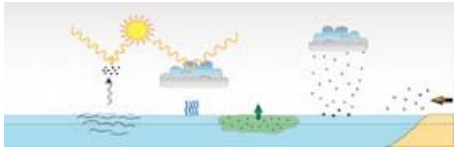
We are also involved in the quantification of aerosol **optical properties**, including their relevance for atmospheric radiative forcing.

TROPOS also hosts a range of meso-scale and micro-scale **atmospheric models** that simulate these aerosol-related processes. Through internal and external collaborations, these models are validated and constrained using high-quality experimental data.

Natural and anthropogenic aerosol sources (primary aerosol)

Natural mineral dust sources

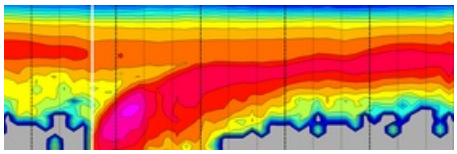
Chemical Characterisation of mineral dust aerosols at the Cape Verde Atmospheric Observatory (CVAO).



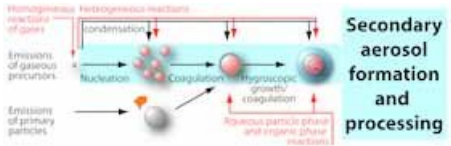
Marine aerosols

Combustion aerosols (biomass burning)

Secondary aerosol formation



New particle formation (nucleation)



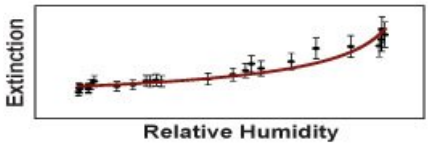
Biogenic and anthropogenic secondary Aerosol

Cloud-induced aerosol formation

Aerosol-Radiation-Interaction

Vertical Material and Radiation Budget

Observations of the vertical distribution of aerosols and its effect on the radiation balance.



Hygroscopic Properties of atmospheric Aerosol

Studies of the effect of changes in humidity on the optical and microphysical properties of aerosol particles.

Impact of aerosols on atmospheric dynamics

Investigation of the impact of absorbing aerosol particles on the radiation budget and atmospheric dynamics.

Leibniz-Institut für
Troposphärenforschung e.V. (TROPOS)
Permoserstraße 15
04318 Leipzig

Phone: ++49 (341) 2717 7060
Fax: ++49 (341) 2717 99 7060
Follow us on Twitter:
@TROPOS_de

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