

# Leipziger Meteorologisches Kolloquium

Donnerstag, 18.01.2024, 14:00 Uhr, TROPOS und online

Link: <https://eu02web.zoom-x.de/j/63495959590?pwd=Ujl1SllyS2xGNHZWc0ZWQWo3ZEoxUT09>

Meeting-ID: 634 9595 9590, Kenncode: 115918

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## ***“Timescales of aerosol-cloud interactions: from opportunistic experiments to radiative forcing”***

Anthropogenic aerosols exert a net cooling effect so that they partially mask greenhouse gas warming. The magnitude of this effect is not well constrained and anthropogenic aerosols remain the most uncertain radiative forcing of the climate system. Aerosol-cloud interactions and resulting changes in cloud reflectivity are the dominant mechanisms behind this uncertainty.

Opportunistic experiments in the form of localized pollution plumes such as from ship exhaust are valuable for the quantification of aerosol-cloud interactions because they provide clear causation between aerosol perturbation and cloud response. At the same time, it is not clear to what extent they can be generalized to constrain the climatological forcing of anthropogenic aerosols.

In this colloquium, we will discuss the importance of different timescales of aerosol-cloud interactions. The discussion will be guided by a large ensemble of detailed cloud simulations (large-eddy simulations). Simulation results will be confronted with satellite-derived short-term tendencies (MODIS Aqua vs Terra). We will argue that aerosol-cloud-interaction timescales are crucial if we are to better constrain the aerosol forcing, especially by leveraging opportunistic experiments.