Nucleation, life cycle and climate impact of contrail cirrus -
new insights — ●Christiane Voigt — Deutsches Zentrum für Luft-
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Current growth rates in aviation demand a profound scientific data
base in order to accurately assess the aviation impact on climate. A
major contribution results from contrail cirrus and their radiative forc-
ing is suggested to outbalance aviation CO2 and NOx effects. Direct
observations of contrail cirrus throughout their life cycle are scarce and
prone to substantial ambiguities currently limiting our understanding
of the climate impact by aviation.

Here, we give new insights into the nucleation, growth, life cycle and
climate impact from contrail cirrus based on results from suite of recent
aircraft experiments. NASAs ACCESSII mission focusses on aircraft
emissions and initial stages of contrail formation. Nascent contrails
were detected at cruise altitudes near 100 m distance to the engine exit.
Contrail growth to 10-min contrail age is investigated during DLRs
CONCERT campaigns. Finally, the objective of the ML-CIRRUS ex-
periment with the HALO research aircraft is to study the life cycle and
climate impact of contrail cirrus with a novel in-situ/remote sensing
payload. The contrail measurements are related to previous observa-
tions and discussed in the context of recent developments in contrail
modeling. Highlights include the quantification of the effects of aircraft
type, engine technology and alternative fuels on contrail microphysics
and climate.

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