Aeronautics Lidar Applications -
Airborne Remote Detection of CAT (Clear Air Turbulence)

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Lidar instruments are used throughout the atmospheric science community as ground-based or airborne measurements devices. Applications are as diverse as aerosol studies, trace gas or water vapor measurements, tracking of gravity waves or temperature profiling.

For aeronautics applications, lidar instruments open a new horizon for future remote detection of atmospheric hazards. Complementary to airborne radar they will be able to further improve aviation safety as stipulated by ACARE's Strategic Research and Innovation Agenda (*SRIA*) and Flightpath 2050 vision.

Applications for aviation include remote detection of glaciated icing conditions, clear-air-turbulence (CAT) and possibly volcanic ash (long-range). On the short-range, lidar systems may determine three-dimensional windvector fields for load alleviation for gusts or wake vortex incursion.

Here we report, as an example of a current activity, on the remote in-flight detection of clear-air-turbulence (CAT) with a direct detection UV lidar. The EC-FP7-financed project 'DELICAT' aims at the demonstration of this technology with a dedicated instrument and flight campaign.