



An Overview of Research Aviation Program at NCAR: Recent Activities and Future Plans

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The Earth Observing Laboratory (EOL) of the National Center for Atmospheric Research (NCAR) manages and operates two heavily modified research aircraft, the NSF/NCAR HIAPER (GV) and NSF/NCAR C-130, at its Research Aviation Facility (RAF) located at the Rocky Mountain Metropolitan Airport (RMMA) near Broomfield, Colorado. In addition to the two aircraft, EOL's airborne program includes an extensive suite of aircraft instrumentation, including both in-situ and remote-sensing instruments for dynamical, thermodynamical, microphysical, radiation and trace gas measurements. A suite of atmospheric chemistry instrumentation is also offered by NCAR's Atmospheric Chemistry Observations and Modeling (ACOM) Laboratory that works in partnership with EOL in supporting atmospheric chemistry campaigns. The NCAR research aviation program is supported primarily by the US National Science Foundation.

The two NSF/NCAR aircraft are deployed world-wide by the NCAR teams in support of airborne observational field campaigns, primarily supporting NSF-funded investigators. Frequently, these airborne campaigns are complex and entail multiple funding agencies and observational assets, including research aircraft operated by different agencies, often in concert with ground based facilities (e.g. radars, lidars, mesonets, profilers, and sounding systems, which are also offered by EOL). The campaigns supported recently by NCAR include ORCAS (GV, Southern Ocean, Jan-Feb 2016), ECLIPSE (GV, US, Aug 2017), SOCRATES (GV, Southern Ocean, Jan-Feb 2018), WE-CAN (C-130, West US, July-Sept 2018). The upcoming deployments are ECLIPSE 2019 (GV, Chile, July 2019), OTREC (GV, Costa Rica, Aug-Sept 2019) and MethaneAIR (GV, Colorado, Nov 2019 and Feb 2020), with a number of campaigns in various proposal stages for the 2020-2022 time-frame.

The NCAR airborne instrumentation program includes also advanced airborne instrument developments (e.g., APAR, HCR, HOLODEC, LAMS, TOGA-TOF) and the Airborne Research Instrumentation and Testing Opportunity (ARISTO) flight test program for newly developed or highly modified instruments as part of their development effort. EOL also provides field project management and data management and archival capabilities, which are an essential part of modern airborne campaigns.