



Data User Guide

GPM Ground Validation UND Citation Navigation Data GCPEX Version 2

Introduction

The Cessna Citation II Research aircraft, owned and operated by the University of North Dakota (UND), participated in the GPM Cold-season Precipitation Experiment (GCPEX) by serving as an in situ microphysics sampling platform. The GCPEX navigation data set, which was collected in Ontario, consists of processed files containing records of flight time, aircraft location (latitude, longitude, and altitude), air temperature, and wind speed among several other parameters.

Notice:

Version 2 of this dataset contains updated navigation information as of May 23, 2016.

Citation

Delene, David and Michael R Poellot. 2016. GPM Ground Validation UND Citation Navigation Data GCPEX V2 [indicate subset used]. Dataset available online from the NASA Global Hydrology Resource Center DAAC, Huntsville, Alabama, U.S.A.

https://fcportal.nsstc.nasa.gov/pub/gpm_validation/gcpex/nav_citation/

DOI: <http://dx.doi.org/10.5067/GPMGV/GCPEX/NAV/DATA002>

Keywords:

Navigation; atmospheric pressure; atmospheric winds, platform characteristics

Campaign

The Global Precipitation Measurement (GPM) Cold-season Precipitation Experiment (GCPEX) occurred in Ontario, Canada during the winter season of 2011-2012. GCPEX addressed shortcomings in the GPM snowfall retrieval algorithm by collecting microphysical properties associated remote sensing observations, and coordinated model simulations of precipitating snow. These data sets were collected to aid in the achievement

of the overarching goal of GCPEX, which is to characterize the ability of multi-frequency active and passive microwave sensors to detect and estimate falling snow.

Further details on GCPEX are available at <http://gpm.nsstc.nasa.gov/gcpex>. More information on the GPM mission is available at <http://pmm.nasa.gov/GPM>.

Instrument Description

The UND Cessna Citation II Research Aircraft used for the GCPEX experiment is owned and operated by the University of North Dakota. The Citation II is a twin-engine fanjet with an operating ceiling of 43,000 feet (13.1 km). The turbofan engines provide sufficient power to cruise at speeds of up to 340 knots (175 ms^{-1}) or climb at 3300 feet per minute (16.8 ms^{-1}). These high performance capabilities are accompanied by relatively low fuel consumption at all altitudes, giving the Citation an on-station time of 3-5 hours, depending on mission type. The UND Citation II has long wings allowing it to be operated out of relatively short airstrips, and to be flown at the slower speeds of 140 kts (72 ms^{-1}) which are necessary for many types of measurements. The Citation is certified for flight into known icing conditions. Further details on the UND Cessna Citation II are available at <http://cumulus.atmos.und.edu/>.

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File Naming Convention

The files are named using the following naming convention.

Data: nav_YYYY_MM_DD_hh_mm_ss.gcpex

PDF: GCPEX_Flight-Time_Details-cit.pdf

Please note that the PDF document outlines the flight date, flight start and stop times, and the type of precipitation event observed.

Table 1: File naming convention variables

| Variable | Description |
|----------|--|
| nav | Navigation file |
| YYYY | Four-digit year |
| MM | Two-digit month |
| DD | Two-digit day |
| hh | Two-digit hour |
| mm | Two-digit minute |
| ss | Two-digit second |
| gcpeX | GPM Cold-season Precipitation Experiment (GCPEX) |

Data Format Description

The GPM Ground Validation UND Citation Navigation Data GCPEX dataset consists of ASCII (.txt) files. Each .txt file contains a header outline the data parameters and associated units within each file, followed by rows of measured data.

Table 2: Data Characteristics

| Characteristic | Description |
|---------------------|--|
| Platform | University of North Dakota (UND) Cessna Citation aircraft II (UND CITATION II) |
| Instrument | ACCELEROMETER, GNSS, GPS |
| Spatial Coverage | N: 46.5, S: 43.5, E: -78, W: -81 (Ontario, Canada) |
| Temporal Coverage | Start date: 01-19-2012 Stop date: 02-24-2014 |
| Temporal Resolution | 1 file per flight |
| Version | 2 |
| Processing Level | 0 |
| Data Format | ASCII |

References

Delene, D. J., Aircraft Data Processing and Analysis Software Package, Earth Science Informatics, 1-16, 2010, DOI URL: <http://dx.doi.org/10.1007/s12145-010-0061-4>, DOI: 10.1007/s12145-010-0061-4.

Contact Information

To order these data or for further information, please contact:

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