



Data User Guide

GPM Ground Validation Citation Videos IPHEX

Introduction

The GPM Ground Validation Citation Videos IPHEX dataset was collected during the Global Precipitation Measurement (GPM) mission Integrated Precipitation and Hydrology Experiment (IPHEX) in the Southern Appalachians, spanning into the Piedmont and Coastal Plain regions of North Carolina. The goal of IPHEX was to evaluate the accuracy of satellite precipitation measurements and use the collected data for hydrology models in the region. These videos show flights on June 6, 2014 and June 8, 2014. The dataset contains MP4 digital video files and videos have been sped up 12.5 times the original speed and are broken into smaller files of about 3.5 minutes each (covering 45 minutes of actual flight time).

Citation

Poellot, Michael R, Andrew J Heymsfield and Michael R Poellot. 2016. GPM Ground Validation Citation Videos IPHEX [indicate subset used]. Dataset available online from the NASA Global Hydrology Resource Center DAAC, Huntsville, Alabama, U.S.A.
DOI: <http://dx.doi.org/10.5067/GPMGV/IPHEX/CAMERA/DATA101>

Keywords

NASA, GHRC, IPHEX, PMM, GPM GV, North Carolina, UND Cessna Citation II Research Aircraft, take off videos, flight videos

Campaign

The Global Precipitation Measurement mission Ground Validation (GPM GV) campaign used a variety of methods for validation of GPM satellite constellation measurements prior to and after launch of the GPM Core Satellite, which launched on February 27, 2014. The instrument validation effort included numerous GPM-specific and joint agency/international external field campaigns, using state of the art cloud and precipitation observational infrastructure (polarimetric radars, profilers, rain gauges, and

disdrometers). These field campaigns accounted for the majority of the effort and resources expended by GPM GV mission. More information about the GPM mission is available at the [PMM Ground Validation webpage](#).

One of the GPM GV field campaigns was the Integrated Precipitation and Hydrology Experiment (IPHEX) which was held in North Carolina during 2014 with an intense study period from May 1 to June 15, 2014. The goal of IPHEX was to characterize warm season orographic precipitation regimes and the relationship between precipitation regimes and hydrologic processes in regions of complex terrain. The IPHEX campaign was part of the development, evaluation, and improvement of remote-sensing precipitation algorithms in support of the GPM mission through the NASA GPM Ground Validation field campaign (IPHEX_GVFC) and the evaluation of Quantitative Precipitation Estimation (QPE) products for hydrologic forecasting and water resource applications in the Upper Tennessee, Catawba-Santee, Yadkin-Pee Dee, and Savannah river basins (IPHEX-HAP, H4SE). NOAA Hydrometeorology Testbed (HTM) has synergy with this project. More information about IPHEX is available at the [IPHEX Field Campaign webpage](#).

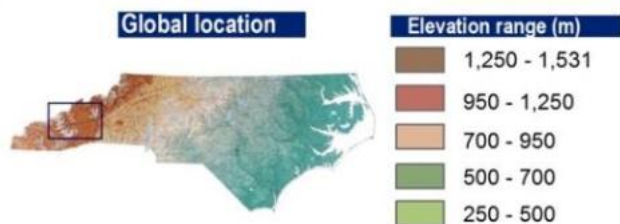


Figure 1: Region of North Carolina IPHEX campaign ground validation
(Image source: <http://gpm-gv.gsfc.nasa.gov/Gauge/>)

Instrument Description

The UND Cessna Citation II Research Aircraft flown in the IPHEX experiment is owned and operated by the University of North Dakota (UND). The Citation II is a twin-engine jet aircraft that can operate at an altitude of up to 43,000 feet (13.1 km), cruise at speeds of up to 175 m s^{-1} and climb at speeds up to 16.8 m s^{-1} . It also has the ability to fly at slower speeds due to its long wingspan. The aircraft has flight time capabilities of around 3 to 5 hours. More information on the Citation II is available at the [UND Cessna Citation II webpage](#)

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Data Characteristics

The GPM Ground Validation Citation Videos IPHEX dataset consists MP4 video files showing flights on June 6, 2014 (1834Z take off) and June 8, 2014 (1817Z take off) .The playback time for each file totals about 3.5 minutes which corresponds to 45 minutes of flight time sped up to 12.5 times the actual speed.

Table 1: Data Characteristics

Characteristic	Description
Platform	UND Cessna Citation II aircraft
Instrument	Cameras
Spatial Coverage	N: 46.5 , S: 35.23, E: -78 , W: -83.1 (North Carolina)
Temporal Coverage	The files cover two flights on June 6, 2014 and June 8, 2014
Temporal Resolution	3.5 minutes of playback time/45 minutes of flight time
Version	1
Processing Level	1A

File Naming Convention

The GPM Ground Validation Citation Videos IPHEX dataset consists of MP4 video files. The two aircraft flights are broken into files of about 3.5 minutes of playback time per file, representing 45 minutes of flight time. These data files have the following naming convention.

Data files: citation_YYYYMMDDx.mp4

Table 2: File naming convention variables

Variable	Description
YYYY	Four-digit year
MM	Two-digit month
DD	Two-digit day
x	Each movie flight is broken into smaller 3.5 minute files (a, b, c, or d)
.mp4	MP4 video file format

Known Issues or Missing Data

There are no known issues with these data or any known gaps in the dataset.

References

Barros, A. P., Petersen, W., Schwaller, M., Cifelli, R., Mahoney, K., Peters-Liddard, C., ... Kim, E. (2014). NASA GPM-Ground Validation: Integrated Precipitation and Hydrology Experiment 2014 Science Plan, 12. <https://doi.org/10.7924/G8CC0XMR>

Related Data

All data from other instruments collected during the IPHEX field campaign are related. Other IPHEX campaign data can be located using [HyDRO 2.0](#) with the search term 'IPHEX'. Below are other UND Citation datasets from the IPHEX field campaign:

GPM Ground Validation UND Citation Navigation Data IPHEX
(<http://dx.doi.org/10.5067/GPMGV/IPHEX/NAV/DATA/001>)

GPM Ground Validation NCAR Cloud Microphysics Particle Probes IPHEX
(<http://doi.org/10.5067/GPMGV/IPHEX/MUTIPLE/DATA201>)

GPM Ground Validation UND Citation Cloud Microphysics IPHEX
(<http://dx.doi.org/10.5067/GPMGV/IPHEX/MULTIPLE/DATA201>)

Contact Information

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

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