Tokyo-FC Field Data Repository

www-air.larc.nasa.gov Introduction

dataID Registration and Data Upload

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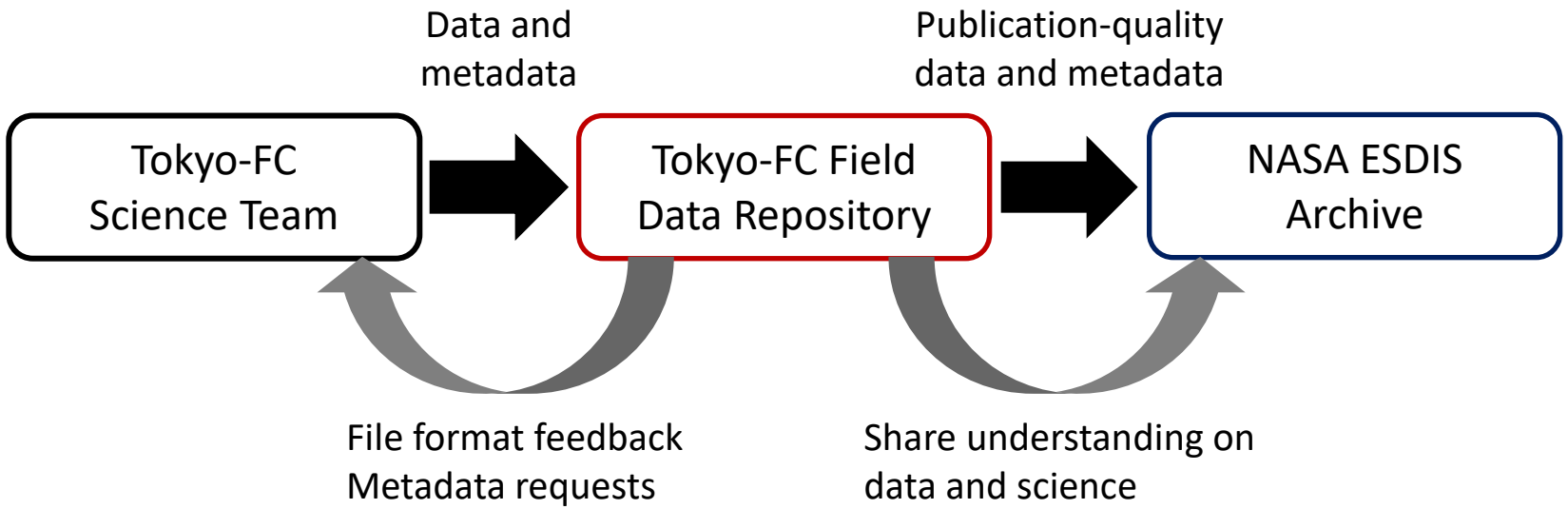
Field Data Repository Introduction

- https://www-air.larc.nasa.gov/missions/tokyo-fc/index.html
- A repository for all Tokyo-FC relevant observational and ancillary data products and relevant documentation/reports to facilitate science team data exchange and data processing
- Data holdings include aircraft data as well as other data as needed/requested
- Data file types include binary (HDF/netCDF), text (ICARTT), and image (jpg/png)
- Password-protected document and file sharing
- Publication-quality ("final") data will be transferred to the HQ-assigned NASA ESDIS archive — communicate with us if you do not want this to be the case!

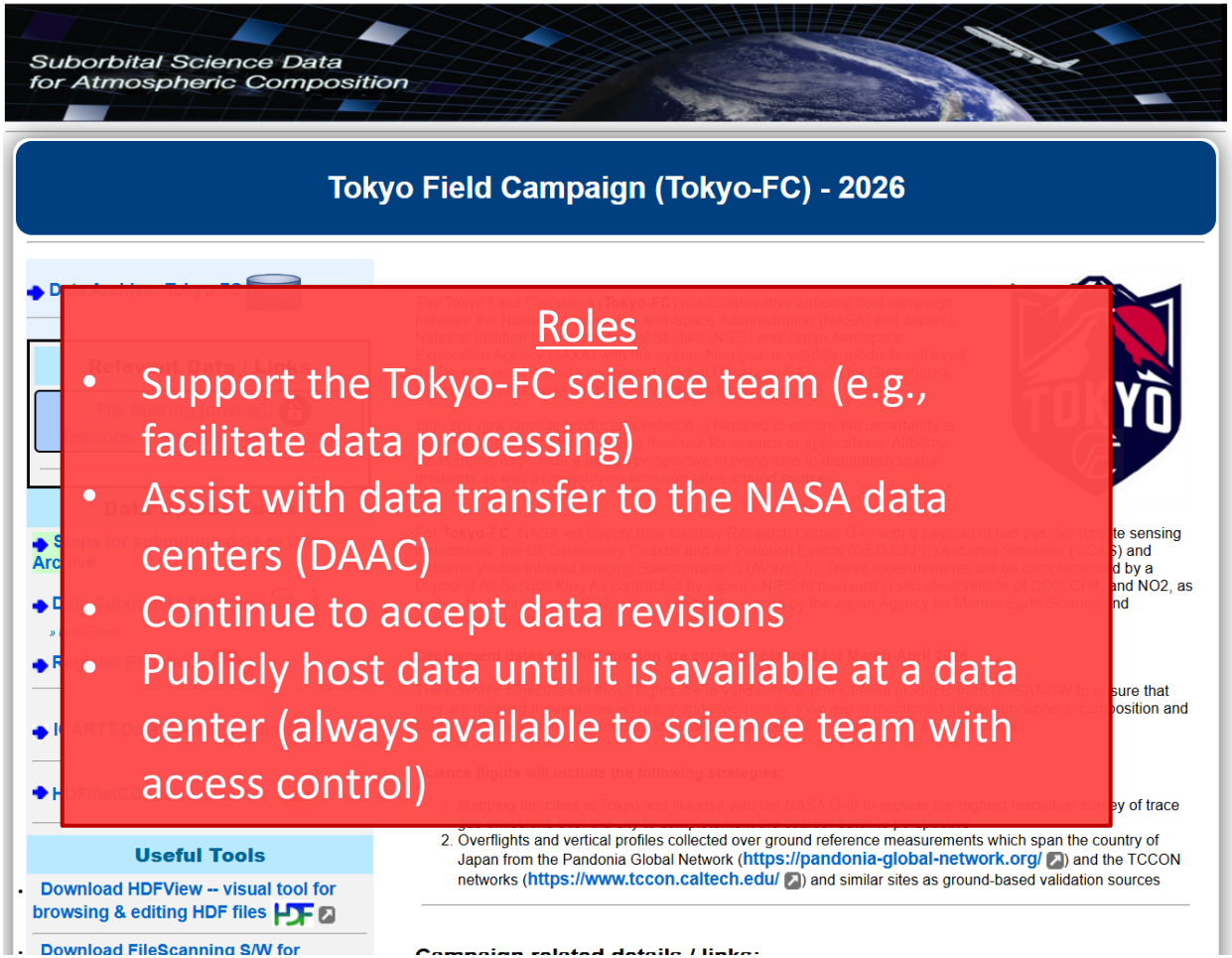
Tokyo-FC Data Flow



- Applies to NASA campaign data – links provided to collaborator data (including complementary campaigns)
- NASA “Facility Instruments” (AVIRIS-5) follow a separate process

Tokyo-FC Data Flow

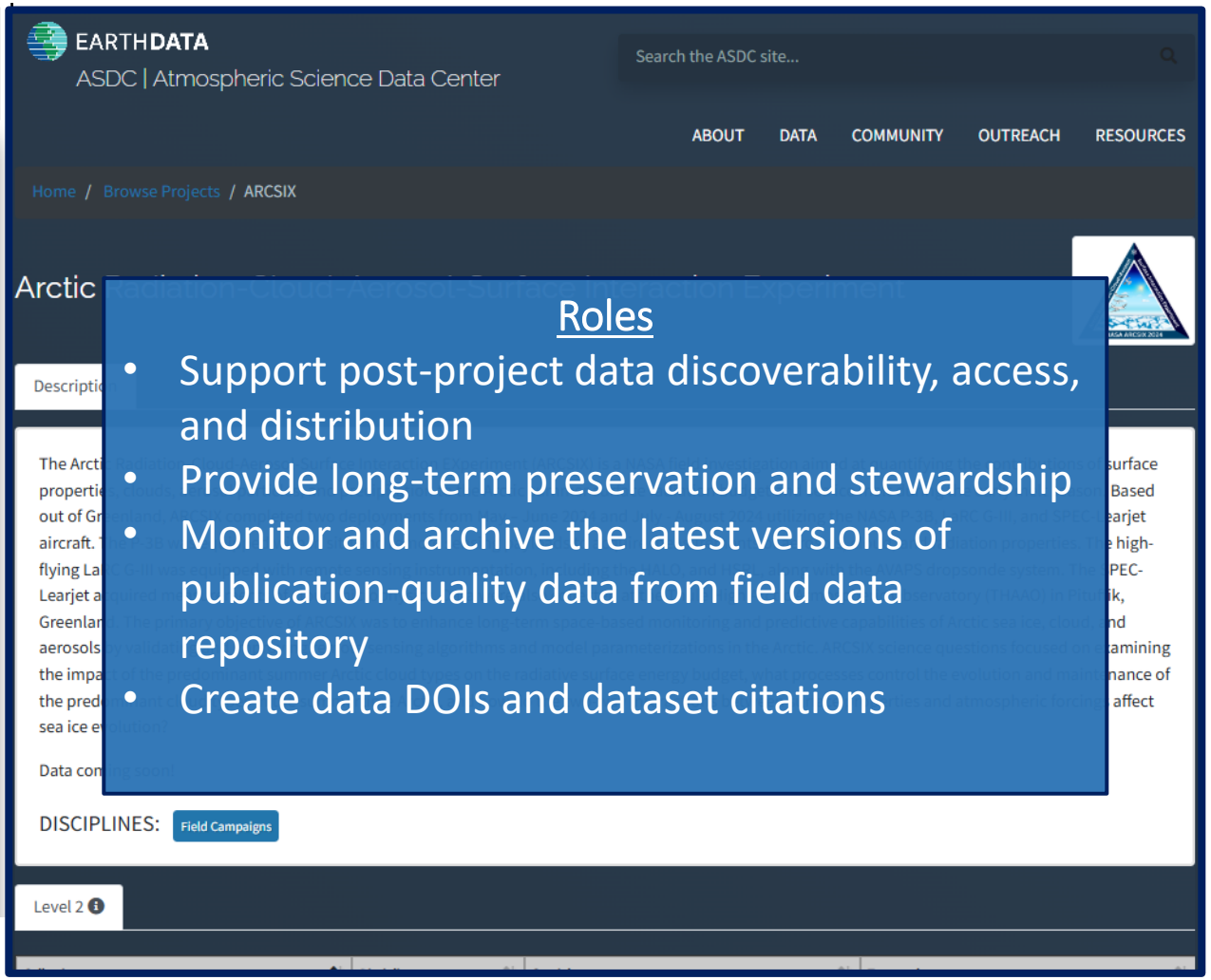
Tokyo-FC Field Data Repository



Roles

- Support the Tokyo-FC science team (e.g., facilitate data processing)
- Assist with data transfer to the NASA data centers (DAAC)
- Continue to accept data revisions
- Publicly host data until it is available at a data center (always available to science team with access control)

NASA ESDIS Archive



Roles

- Support post-project data discoverability, access, and distribution
- Provide long-term preservation and stewardship
- Monitor and archive the latest versions of publication-quality data from field data repository
- Create data DOIs and dataset citations

Tokyo-FC Field Repository

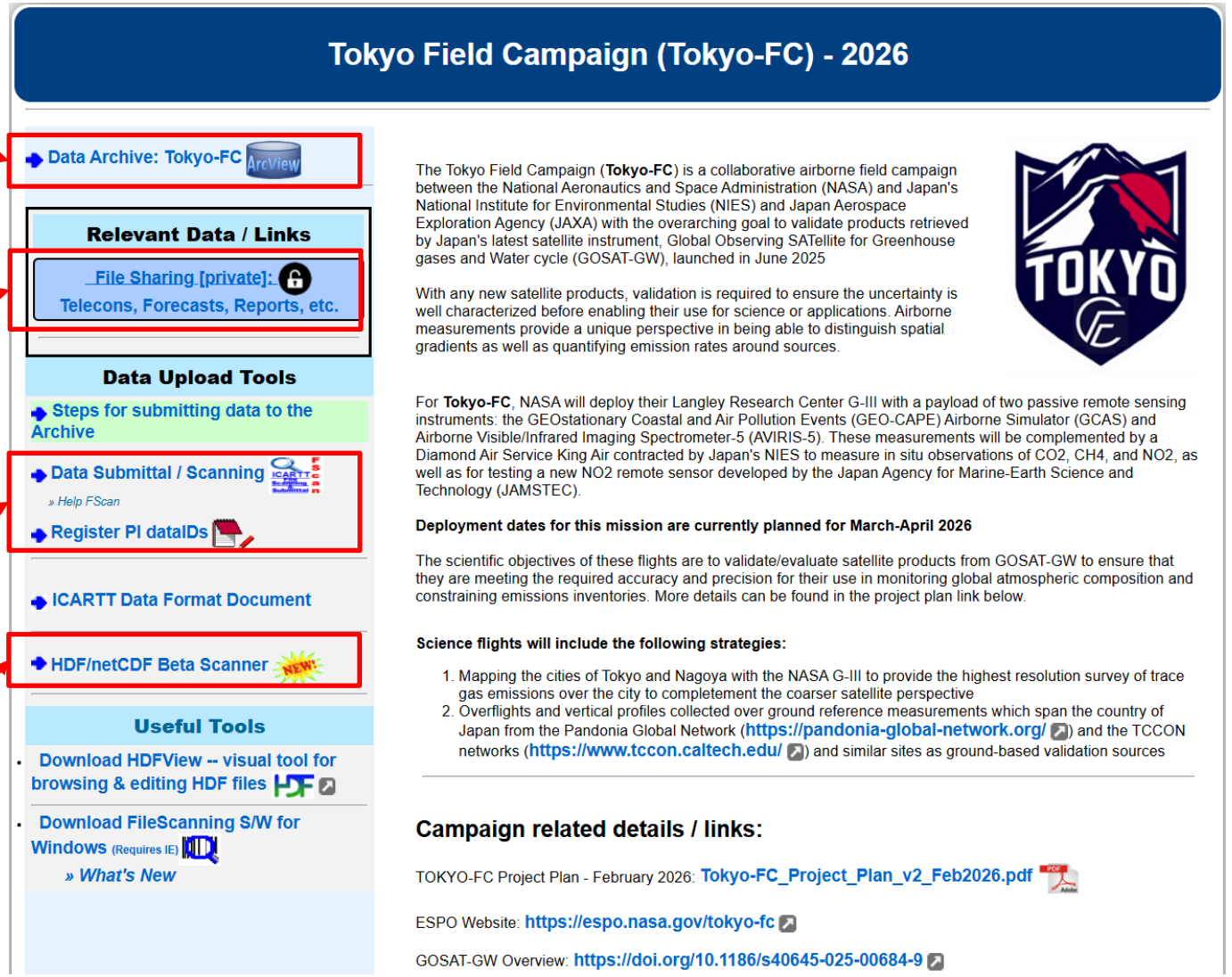
Data Access

Document Upload/Download

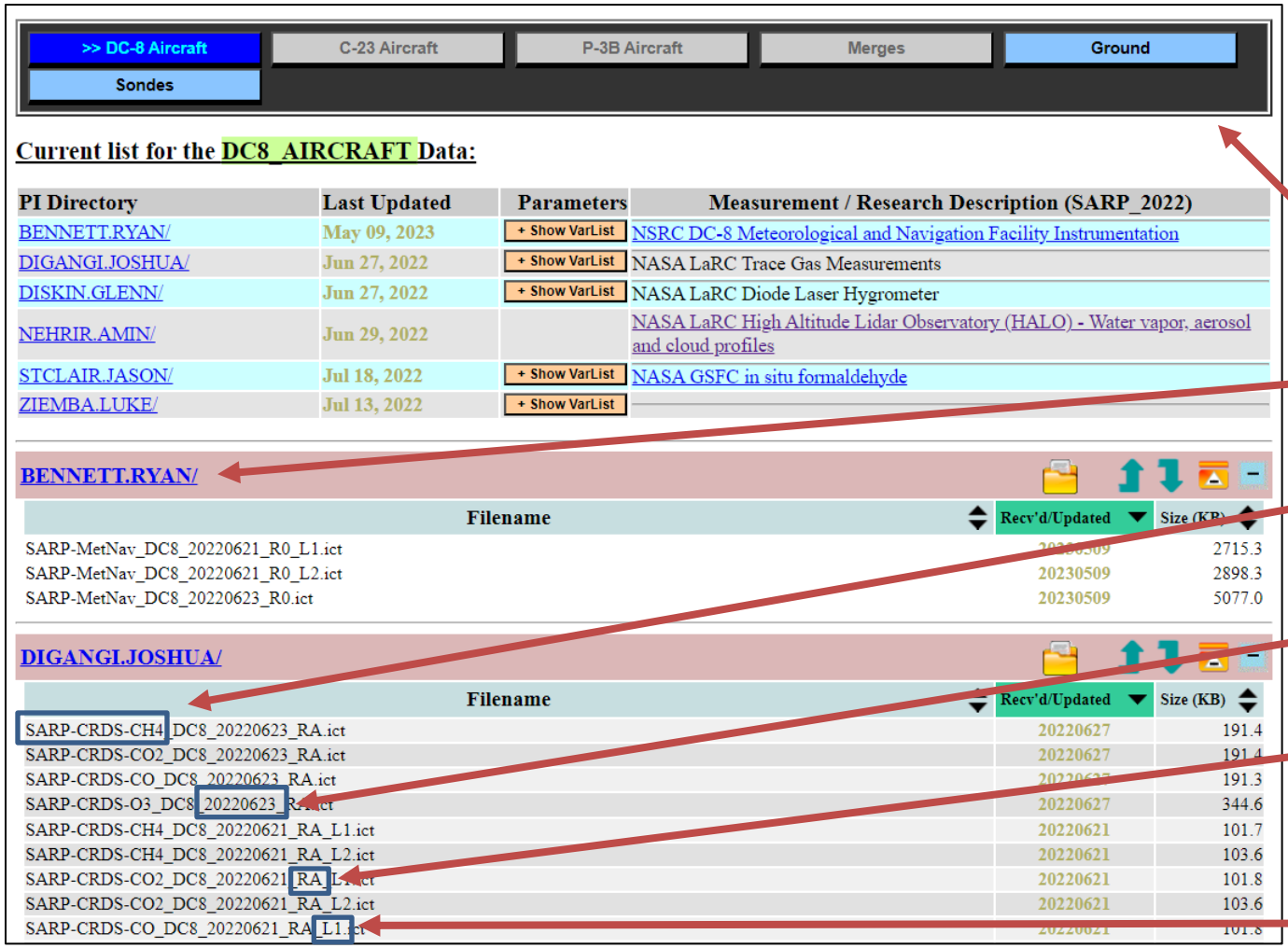
DataID Registration and Data Upload

Script-based tool for large file (i.e., 2 – 25 GB) upload

HDF/netCDF checker



Data Access: SARP Example

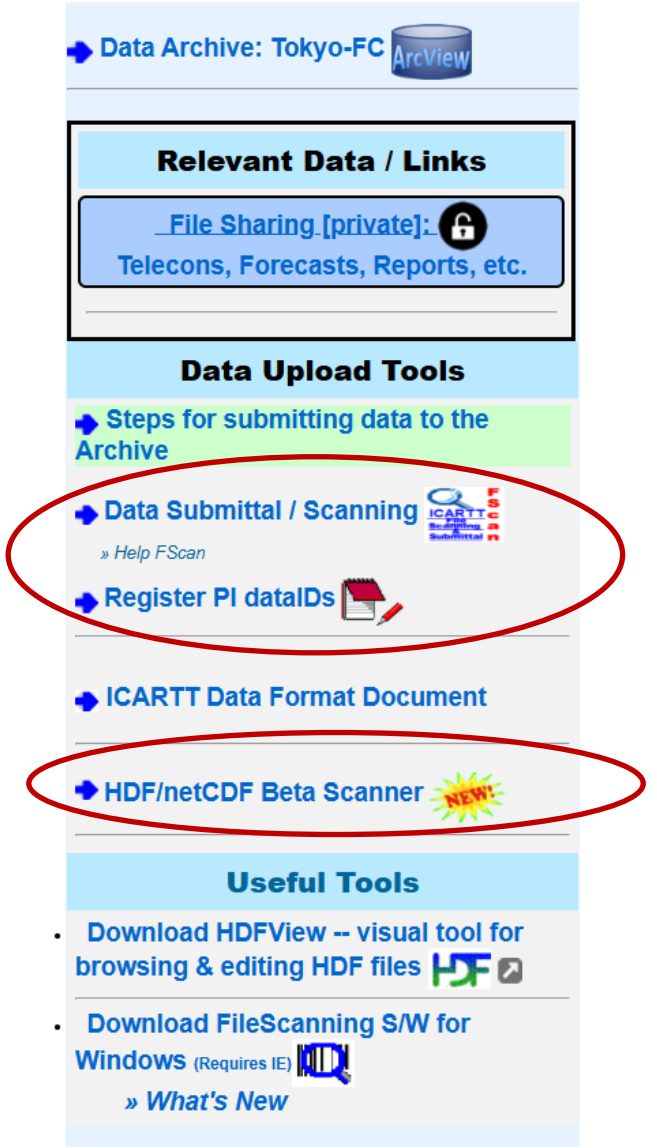


Data Organization:

1. locationID (Platform)
2. Principal Investigator
3. dataID (identifier)
4. Flight or data collection dates
5. Revision number (version control)
6. Launch number

Data Submission Steps

- DataID Registration (one-time process):
  - dataID is part of the filename and will be used to organize PI files on the data repository (links data files to PI)
  - PI or file creator will need to first register dataID(s) before files can be submitted
- Data Submission:
  - File submission is through a scanning tool (FScan) for checking filenames and content
  - All incoming files are scanned:
    - ICARTT Files: file header, including keywords and data flags, as well as time stamps
    - Other files: file names
    - HDF and netCDF files should be checked using the HDF/netCDF scanner
  - Support zipped multi-file upload
  - Script-based batch upload and download available
- Username/password: contact POCs



DataID Registration Page

DataIDs Registration -- ACTIVATE 2022

A dataID is the first part of an ICARTT [type] data filename (see the Data Format Document for details). Each dataID (per platform) must be unique.

IMPORTANT (PLEASE READ)

This registration is ONLY valid for the Platforms listed in the "Platform Box". Do NOT register if your platform is not listed. YOUR "PLATFORM DATA MANAGER" IS RESPONSIBLE FOR YOUR DATA ARCHIVING NEEDS.

The PI's data directory will be created from LastName.FirstName. Please enter PI name correctly. Each dataID represents a [separate] group of files in PI's data directory.

See file naming convention slide

PI Last Name : BENNETT

PI First Name : RYAN

Platform (LocationID) : NASA King Air Aircraft (KINGAIR)

	dataID: (max 45 chars) *Prefix with "activate-"* e.g., activate-CO2	Data Description: (max 380 chars) *Describe your measurments; e.g.,* Carbon Dioxide Mixing Ratio	Instrument(s): (max 190 chars) *List Instruments; e.g.,* LI-COR 6252
Reset	activate-MetNav	NSRC UC-12 Meteorological and Navigation Facility Parameters	Varies

+ Add Another dataID - Remove Last Entry

Upload Your Instrument(s) Description Document: Choose File No file chosen (Select your file)

(NOTE: Any new file/document upload WILL OVERWRITE your previously uploaded document)

(If you have more than 1 file (document) to upload, please email the files to: gao.chen@nasa.gov and/or ali.a.aknan@nasa.gov. Thank you!)

☐ OVERWRITE my previous record (i.e., ALL previously registered dataIDs for this mission will be removed).

Link to PI website, instrument, experiment description, etc

https://baeri.org/nsrc/ *Optional: to display on LaRC Archive webpage*

Text describing PI experiment or measurements (e.g., NASA LaRC DIAL - Troposphere O3, Aerosols, and Clouds Profiles):

NSRC UC-12 Meteorological and Navigation Facility Parameters *Optional: to display on LaRC Archive webpage*

Submit

Current Registered dataIDs on the Server for ACTIVATE 2022

PI Name: Last.First	LocationID	Registered dataIDs

Registered DataID Example

PI Last Name : HAIR

PI First Name : JOHN

Platform (LocationID) : LaRC GIII Aircraft (LARC-G3)

	dataID: (max 45 chars) *Prefix with "asiaaq-"* e.g., asiaaq-CO2	Data Description: (max 380 chars) *Describe your measurments; e.g.,* Carbon Dioxide Mixing Ratio	Instrument(s): (max 190 chars) *List Instruments; e.g.,* LI-COR 6252
Reset	asiaaq-HSRL2	HSRL measurements of clouds and aerosols, as well as DIAL measurements of Ozone Concentration	HSRL2
Reset	asiaaq-HSRL2-images	Full flight images of the lidar measurements of clouds, aerosols, and ozone, plus raster-specific images within a flight, designated as Ln (n can be 1,2,3,or 4)	HSRL2
Reset	asiaaq-HSRL2-mlh	Aerosol derived mixed layer heights and mean backscatter and extinction within several layers from HSRL2	HSRL2
Reset	asiaaq-HSRL2-NearSurface	High horizontal resolution measurements of HSRL2 atmospheric aerosol and ozone with lower vertical resolution. Several combinations of horizontal and	HSRL2

+ Add Another dataID - Remove Last Entry

Upload Your Instrument(s) Description Document: Choose File No file chosen (Select your file)

(NOTE: Any new file/document upload WILL OVERWRITE your previously uploaded document)

(If you have more than 1 file (document) to upload, please email the files to: gao.chen@nasa.gov and/or ali.a.aknan@nasa.gov. Thank you!)

☐ OVERWRITE my previous record (i.e., ALL previously registered dataIDs for this mission will be removed).

Link to PI website, instrument, experiment description, etc

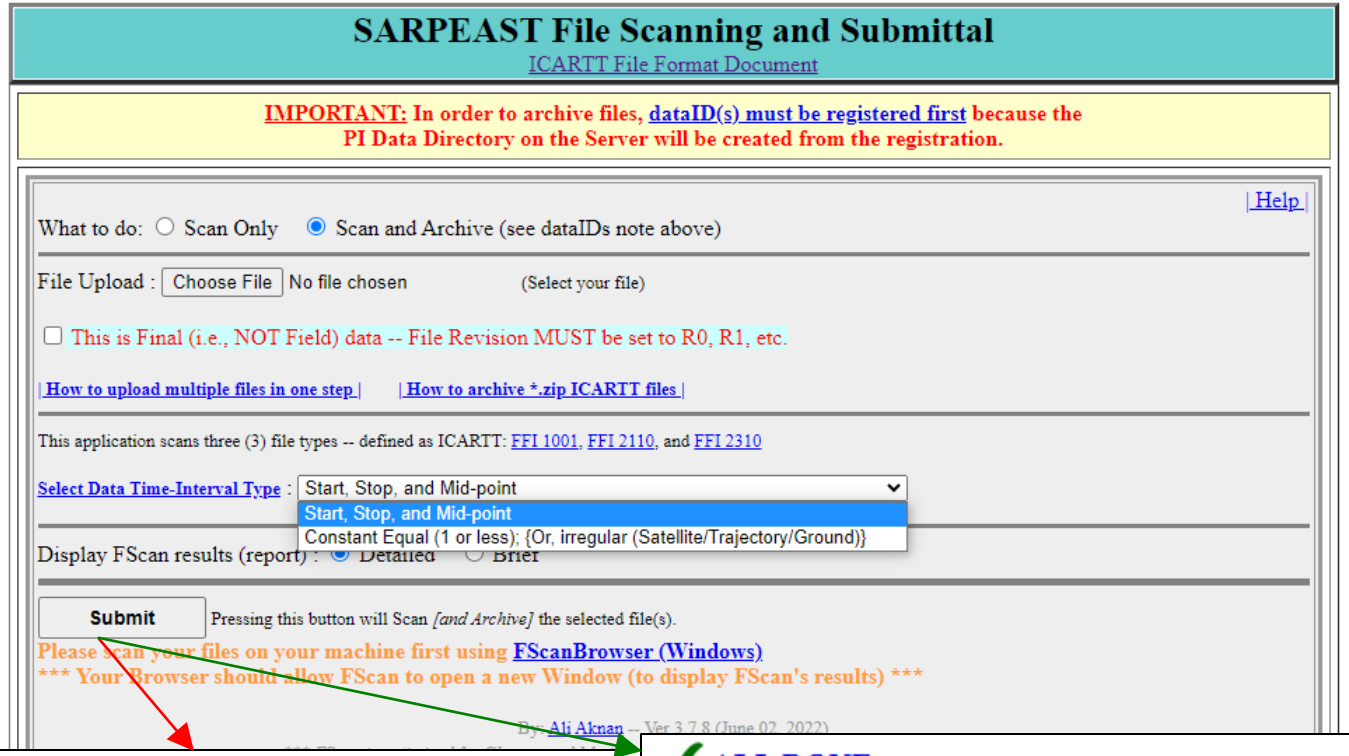
https://science.larc.nasa.gov/hsrl/ *Optional: to display on LaRC Archive webpage*

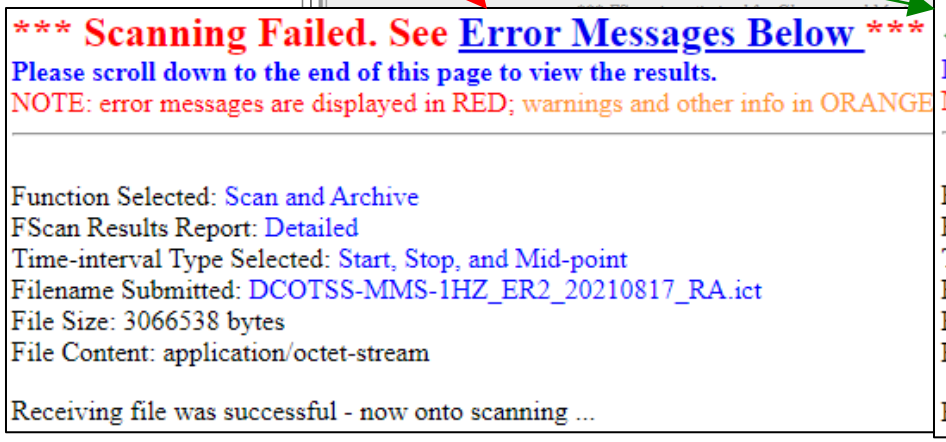
Text describing PI experiment or measurements (e.g., NASA LaRC DIAL - Troposphere O3, Aerosols, and Clouds Profiles):

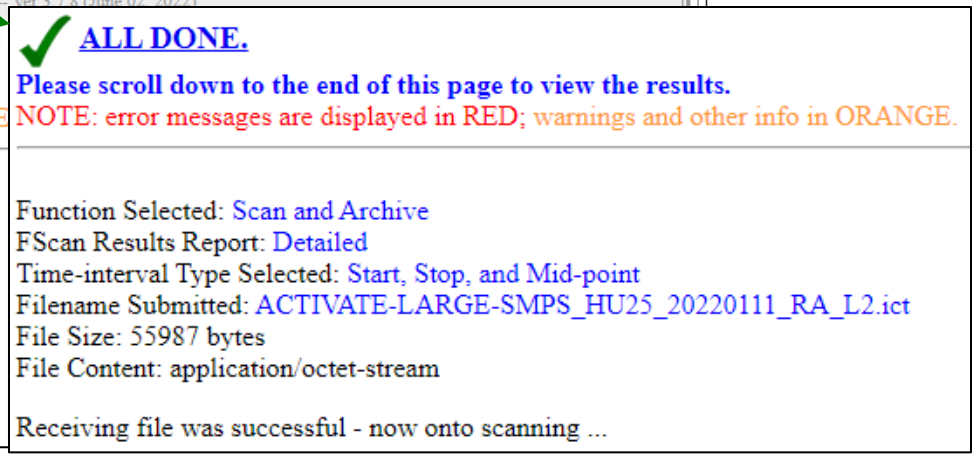
NASA LaRC High Spectral Resolution Lidar , Generation 2 *Optional: to display on LaRC Archive webpage*

Submit

FScan Page







Note: results open on a separate page, may need to change browser permissions

Tokyo-FC File Naming Convention

DataID_LocationID_YYYYMMDD_R# [_Description].extension

- **DataID**: a short description of measured parameter/species, instrument, or model prefixed by “TOKYO-FC-”
- **LocationID**: an identifier of measurement platform/type, provided on the dataID registration website in a drop-down box
  - Tokyo-FC locationIDs: NASA-G3, DAS-KINGAIR, Ground, Cargo-Ship, Satellite, Model, Analysis, and Other; please reach out if others are needed
- **YYYYMMDD**: **UTC** date of takeoff for flight data or the beginning of the measurement for ground sites
- **R#**: Revision identifier for version control. Typically RA, RB, RC, … for field data and R0, R1, R2, … for the publication quality data. Note: archived files cannot be overwritten, *only replaced with subsequent revisions*
- **Description**: optional additional description of the file if necessary
- **Extension**: “ict” for ICARTT files, and “h5” for HDF 5 files, nc for netCDF files, etc.
  - Allowed: *.ict, *.nc, *.cdf, *.hdf, *.h4, *.h5, *.hdf4, *.hdf5, *.he5, *.kmz, *.kml, *.htm, *.html, *.txt, *.jpg, *.jpeg, *.gif, *.png, *.bmp, *.pdf, *.xls, *.xlsx, *.doc, *.docx, *.ppt, *.pptx
  - Upon request: *.zip, *.tar, *.gz, or others
- The underscore, “_”, is used ONLY to separate the different fields of the filename
- Examples: the filename for Tokyo-FC GCAS measurement made on a March 8, 2026, flight may be:
  - tokyo-fc-GCAS-NO2_NASA-G3_20260328_RA.ict (for field data)
  - tokyo-fc-GCAS-NO2_NASA-G3_20260328_ R0.ict (for publication quality data)

Tokyo-FC Data Submission Schedule

Mission Phase	Data Type	Submission Deadline	Access Control
Field Deployment	Field Data	Typically 24 hour after each flight or cal. Day	Science team and Partners
Post-Deployment	Publication-quality or “Final” Data	6 months after campaign concludes	Public

- Field data submission deadline may vary depending on field operation constraints
- The final data should be of publication quality and time synced to the time standard for each platform for in-situ measurements

Tokyo-FC Data Format Requirements

- The Tokyo-FC data will conform to **ICARTT, netCDF, or HDF** format standards. This supports NASA's Open-Source Science and Open Data initiatives by making Tokyo-FC data FAIR
- All in-situ measurements are required to report data in ICARTT format (https://www.earthdata.nasa.gov/s3fs-public/imported/ESDS-RFC-029v2.pdf)
- ICARTT files will be scanned to ensure compliance with the format requirements
- HDF and netCDF files should be compliant with https://www-air.larc.nasa.gov/missions/etc/CORE_Requirements_Document_for_Atmospheric_Data_Feb2026.pdf
- Assistance will be available to the science team to troubleshoot file format and submission issues

Tokyo-FC Data Reporting Best Practices using ICARTT file

- For in-situ measurement ICARTT files, please use the same number, names, and order of variables throughout the mission for files within the same dataID and revision.
- Measurement Time Reporting in ICARTT files:
  - Fixed variable name(s): Time_Start, Time_Stop, and Time_Mid
  - Report start, stop, and mid times if integration interval larger than 1 sec
  - Can use one time stamp (e.g., Time_Start or Time_Stop) for data at ≥ 1 Hz
- Use the ICARTT file header (e.g., DATA_INFO) or metadata to indicate whether the measurement time is synced to the time standard
- Report absolute concentrations and aerosol extensive properties at STP: 273.15K and 1013.25 hPa (i.e., 0°C and 1atm)
- Clearly indicate if the trace gas measure is respect to dry air or ambient air
- Variable short name should not start with a number or contain "-"
- Use standard unit notation: WMO Codes Registry : wmdr/unit, adopted by NASA

Tokyo-FC Data Reporting Best Practices using HDF/netCDF file

- Use global attributes to describe data, data file, data source (e.g., instrument), data spatial/temporal coverage, data processing and revisions, and contacts
- Use dimensions, avoid using fake_dims
- Data variables should be properly dimensioned
- Variable short name should not start with a number or contain "-"
- Data variables need to have "long_name" and "units" attributes
  - ✓ use long_name attribute to define the time stamp is instantaneous, or start, mid, or stop time of the period
  - ✓ Use standard unit notation: WMO Codes Registry : wmdr/unit, adopted by NASA
  - ✓ Use "degrees_north" and "degrees_east" for lat and lon
- Data flag variables should have "flag_masks" and "flag_meanings" attributes, instead of "units" attribute
- The HDF/netCDF template and checker will be posted on the field data repository
- The checker can be configured for specific instrument variable checks

ACVSNC Variable Standard Names

- Atmospheric Composition Variable Standard Name Convention (ACVSNC) is a NASA Earth Science Data Systems convention, intended to make data more findable and interoperable, and (re)usable:

  https://www-air.larc.nasa.gov/missions/etc/AtmosphericCompositionVariableStandardNames.pdf

- Applicable to geophysical variables or level 2 data products
- Tags, **NOT** short names:
  - **For ICARTT files: short name, unit, *standard name,* long name**

    CH2O_pptv, pptv, *Gas_CH2O_insitu_S_AVMR,* mixing ratio by volume

    CH2O_LOD_pptv, pptv, *Gas_CH2O_insitu_S_AVMR,* Limit of Detection

    NOy_pptv, pptv, *Gas_NOyasNO_insitu_M_AVMR,* Total Reactive Nitrogen Mixing Ratio

    Sc700_total, Mm-1, *AerOpt_Scattering_insitu_red_RHd_Bulk_AMB,* Dry Scattering at 700nm (Total Aerosols)

  - **For netCDF and HDF files: use ACVSN_standard_name attribute**
- Contact Morgan, Gao, or Michael for questions or adding new standard names

WIGOS Measurement Unit Standard

- New NASA unit notation standard
  - Adoption of WIGOS (World Meteorological Organization (WMO) Integrated Global Observing System) Metadata Representation code list for measurement units (https://codes.wmo.int/wmdr/unit)
- Intended to make unit notation more (re)usable across data files
- Examples:
  - Water Vapor Mixing Ratio: g.kg-1
  - U wind speed: m.s-1
  - Potential Vorticity: K.m2.kg-1.s-1 (i.e., 10^6 PVU)
  - Unitless Variables: 1
- Contact Morgan or Gao for questions regarding notation

. replaces /

Tokyo-FC Science Data Policy

All participants are requested to accept the following responsibilities:

- Submit data in a community-accepted format and follow the data format best practices
- **Publication-quality or "final" data must be submitted to the data repository prior to any public presentation at scientific conferences (e.g., AGU, AMS) or manuscript preparation. Exceptions are only allowed with leadership permission.**
  - NASA-funded participants need to follow the NASA SMD Science Information Policy (data must be publicly accessible, no exclusive access)
- Consult with instrument PIs when using their data in conference/data workshop presentations and/or manuscripts
- Invite instrument PIs of any data used to be co-authors
- PIs should be available to answer questions about their data. Also, README documents are very helpful!

Points of Contact

- **Field Repository (www-air.larc.nasa.gov)**
  - Michael Shook, NASA Langley Research Center, michael.a.shook@nasa.gov, 757-864-5793
  - Gao Chen, NASA Langley Research Center, gao.chen@nasa.gov, 757-759-5642 (cell)
  - Ali Aknan, AMA/NASA Langley Research Center, ali.a.aknan@nasa.gov (website and file scanner)
  - Crystal Gummo, AMA/NASA Langley Research Center, crystal.gummo@nasa.gov (website and file scanner)
  - Morgan Silverman, AMA/NASA Langley Research Center, morgan.l.silverman@nasa.gov (standard name issues)

Please free feel to reach out for data download, upload, format, and ACVSNC standard name issues

Example Document Sharing Page

- https://www-air.larc.nasa.gov/cgi-bin/DocXhg/SARPDocs

Login here to view/upload documents

User ID :

Password : Login

SARP Documents / File Sharing

Status Update	Telecons	Presentations	Publications	Forecasts	Meetings	Research & Other Docs	Mission Reports	Hide All

No.	Date Recv'd	[Author Name] Document Description
1.	2023-06-15	[Travis] DA-B200 Flight Report 20230613 1230 [1.69 MB] * mission_report
2.	2023-06-15	[Travis] DA-B200 Flight Report 20230613 0930 [1.13 MB] * mission_report
3.	2023-06-15	[Travis] DA-B200 Flight Report 20230613 1230 [1.44 MB] * mission_report
4.	2023-06-15	[Travis] DA-B200 Flight Report 20230613 0930 [1.13 MB] * mission_report

* *Login Required*

Example Document Sharing Page

- https://www-air.larc.nasa.gov/cgi-bin/DocXhg/SARPDocs
- File upload process:
  - Log in
  - Choose file, document type, author name, and text to appear on the file list
- File list is public, but viewing/downloading requires logging in