CERES Science Team Meeting

Items for Discussion - May 2000

Instrument simulator update

New version of view_hdf validation tool

Data and code deliveries

Data product versions

J.F.Kibler@LaRC.NASA.GOV
Radiation and Aerosols Branch
Atmospheric Sciences Research
NASA Langley Research Center

These charts: http://asd-www.larc.nasa.gov/ceres/science_team/quart_rept.html

CERES Instrument Simulators

To simulate electronic operation - not mechanical operation

- **Use un-modified CERES flight software loads and supporting bench checkout software**
- **Real-time graphic instrument display and GUI interface**
- **Use MATLAB engineering models for azimuth and elevation gimbal response**

TRMM and Terra simulators operational

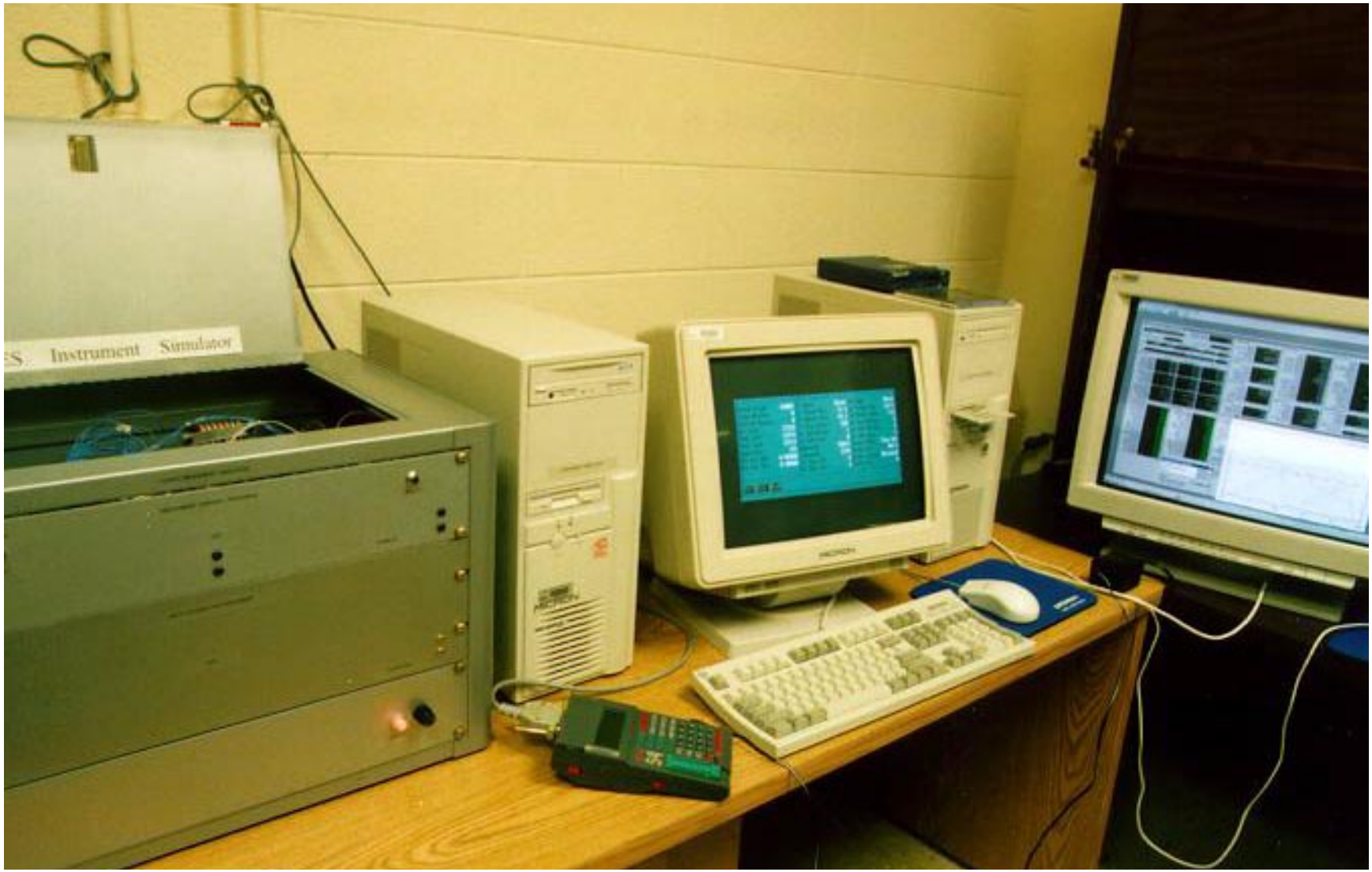
- **Essential for testing and validation of:**
  - **- command sequences**
  - **- scan tables**
  - **- software patches**
  - **- long command uploads**
- **Used extensively in ongoing TRMM noise anomaly investigation - caught errors**

Aqua simulator in development

- **Embedded processors built and tested**
- **Links TRW Bench Checkout Unit and instrument PC with 4 ISA slots for I/O cards**
- **Reconfiguring now to match Aqua interfaces**

CERES TRMM Instrument Simulator

‘Flight’ electronics **MATLAB gimbal models** **Telemetry monitor**



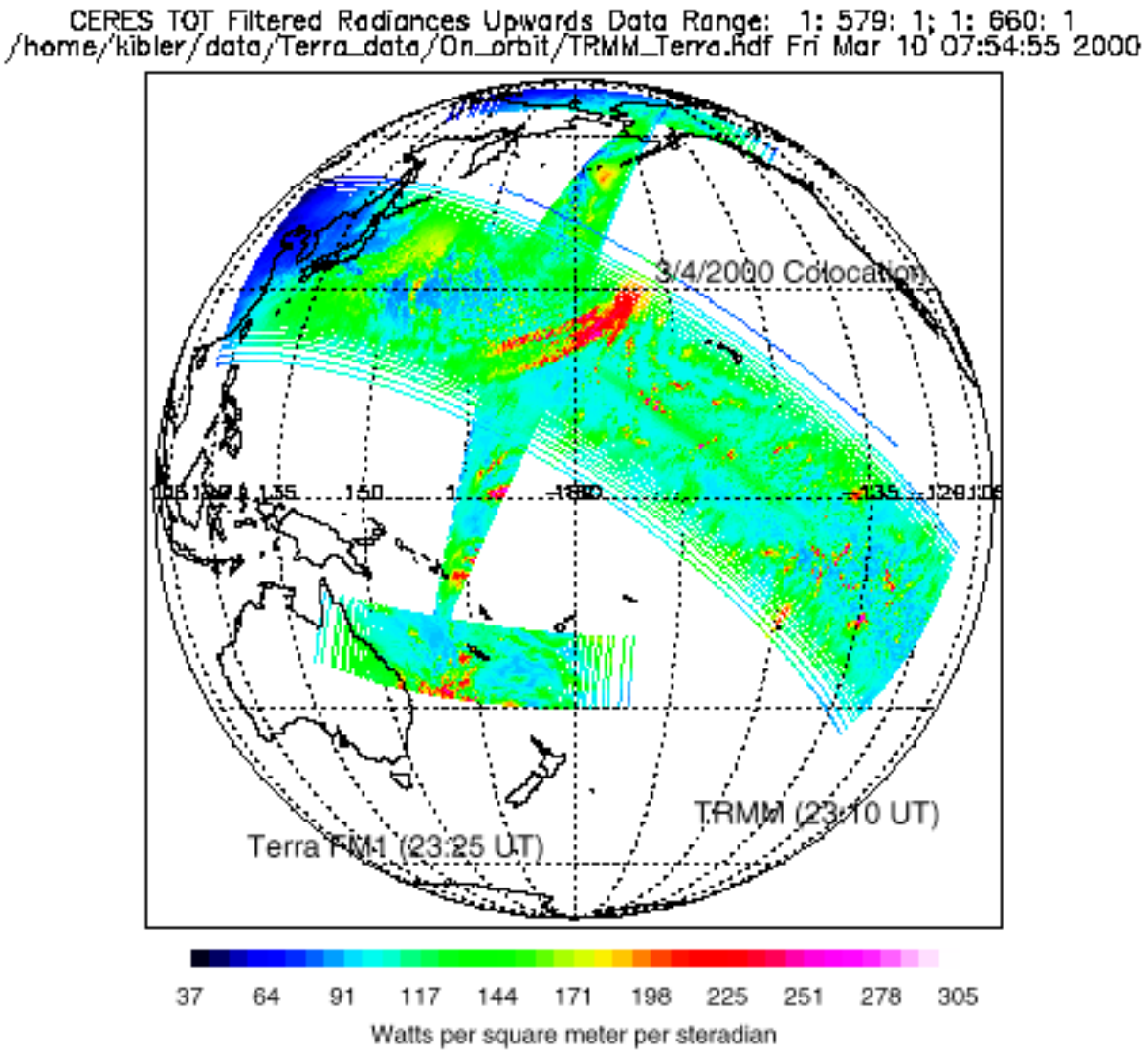
view_hdf Release 2.2.5 delivered to DAAC

Contact Langley DAAC for latest version: http://eosweb.larc.nasa.gov/HPDOCS/view_hdf.html

- **Exremely useful for validation and anomaly investigations**
- **Works with both Hierarchical Data Format (HDF) and HDF-EOS**
- **Requires IDL, Version 5 or above**
- **Downloadable tar files for:**
  - **SGI Irix**
  - **Sun Solaris**
  - **HP HP-UX**
  - **DEC Alpha Digital Unix**
- **New features:**
  - **export ASCII and Tecplot format with and without fill data**
  - **export and add data to HDF files**
  - **more options on compute menu (exponentiation and transcendental functions)**
  - **remembers recently used files**
  - **XY plots versus any subsetted variable**
  - **contour geolocated plots - much smaller postscript outputs (still has a few quirks)**
  - **rename subsets**
- **PC version demonstrated during breaks**
- **Cooperative effort with DAAC**
  - **CERES makes enhancements**
  - **DAAC handles distribution and support**
  - **Kam-Pui Lee and Linda Hunt demonstrated capabilities at several conferences**

TRMM/Terra Intercomparison

FM1 scan plane rotated to align with PFM scan plane



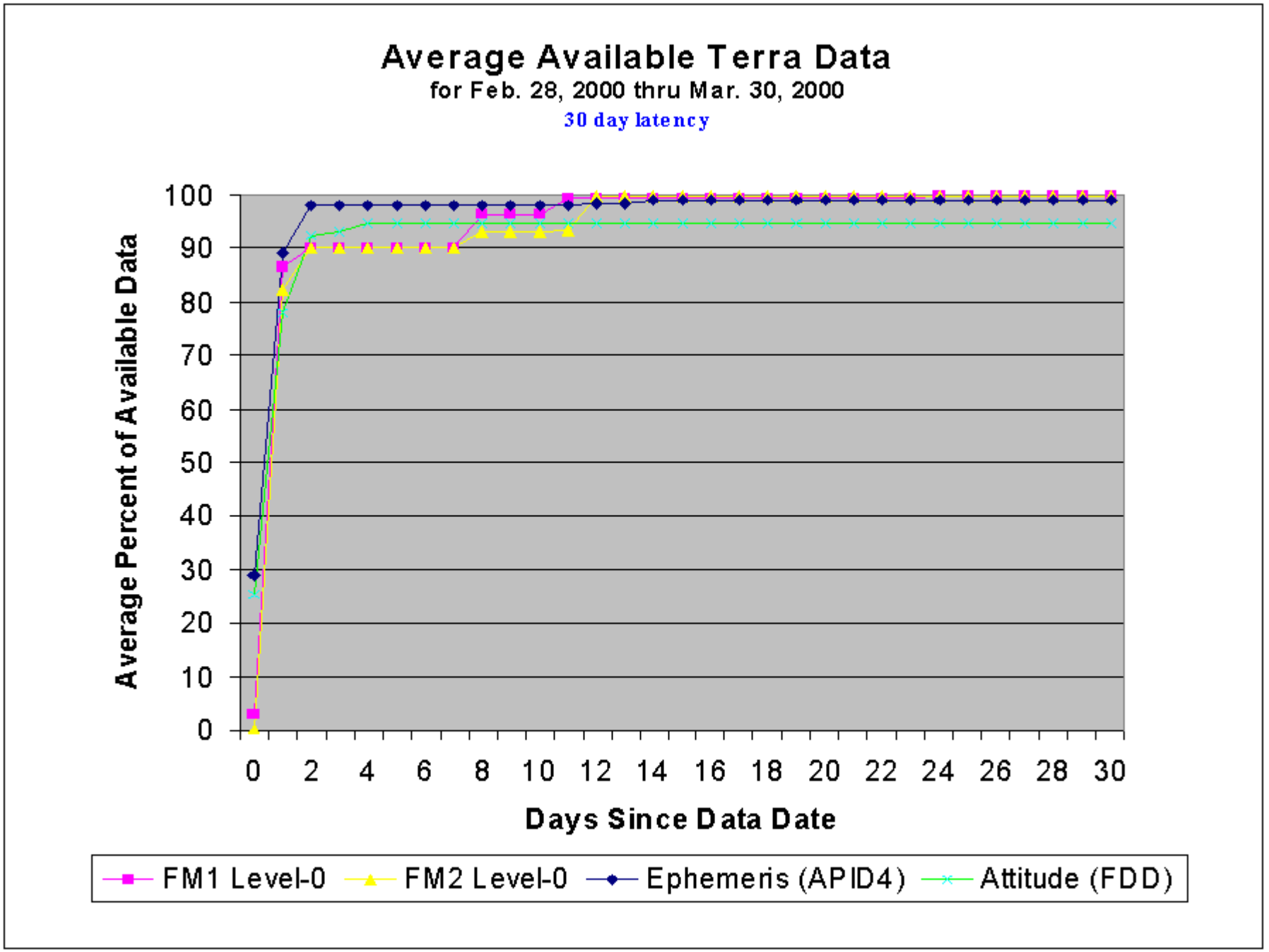
The data flood has begun...

TRMM data flow began after February 25 power-on

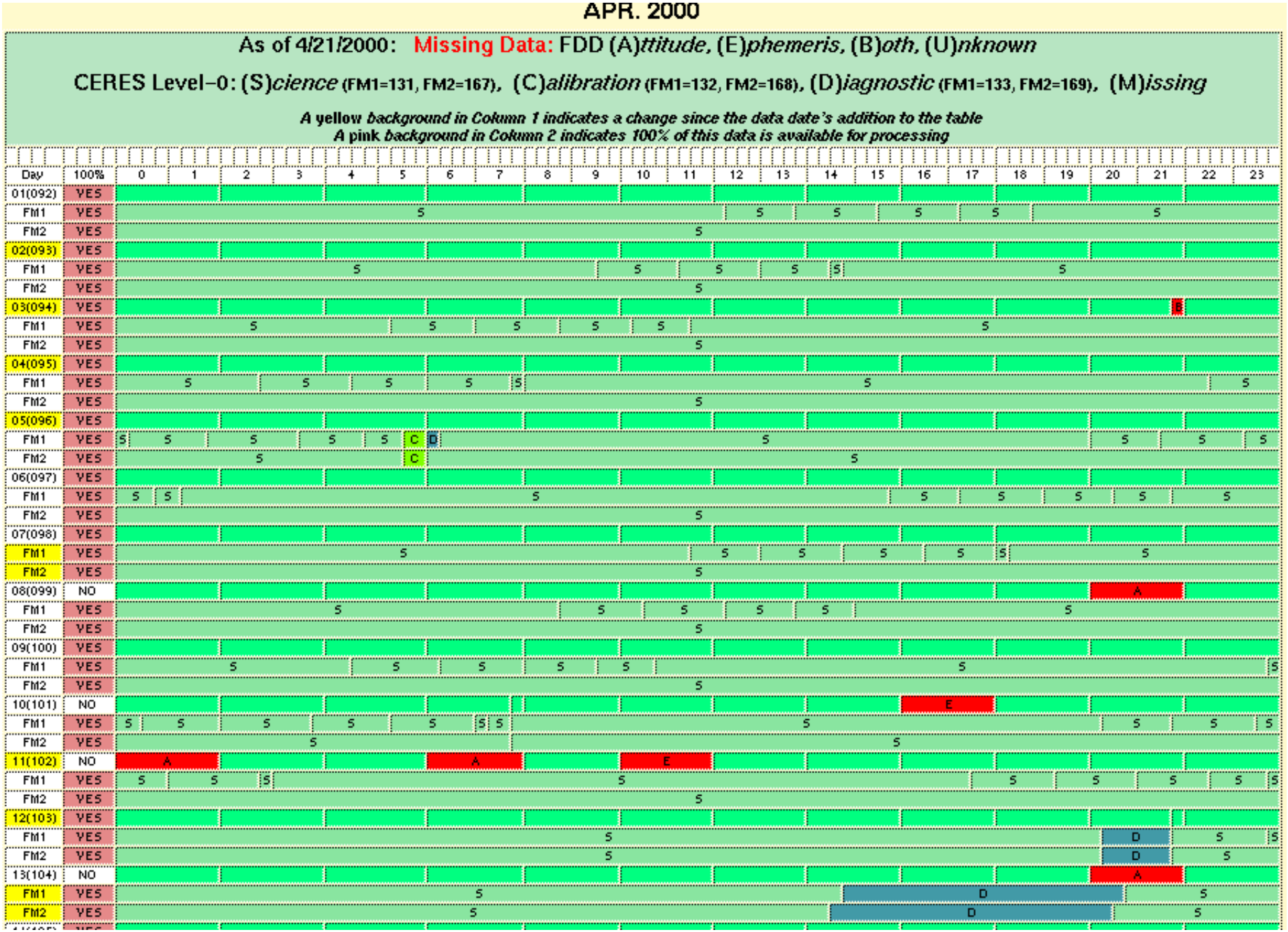
- **Virtually 100% data coverage from all sources at all times**
- **Excellent support from TRMM MOC, PACOR, and Langley DAAC for anomaly investigations**

Tracking Terra data flow has been a challenge

- **Any given day of CERES data from Terra requires:**
  - **24-hour Level 0 and metadata file per APID per instrument - perhaps 12 files**
  - **2-hour granule and metadata file for both attitude and ephemeris plus overlap - 56 files**
- **Each file has many opportunities for loss or corruption**
  - **For example, there are nine data interfaces between Terra and LaTIS for attitude data**
  - **If each interface is 95% efficient, we get 63% of the data...**
- **Initial operations had many teething problems which were not discovered by pre-launch sims**
- **After much scrambling at EDOS, Flight Dynamics and Langley DAAC:**
  - **100% coverage of Level 0 data from FM1 and FM2 from 4/1 through 4/22**
  - **More recent deliveries of Level 0 data have been inconsistent**
  - **Still problems with 2-hour chunks of attitude and ephemeris**


Average Available Terra Data
for Feb. 28, 2000 thru Mar. 30, 2000
30 day latency
Average Percent of Available Data
100
90
80
70
60
50
40
30
20
10
0
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30
Days Since Data Date
FM1 Level-0
FM2 Level-0
Ephemeris (APID4)
Attitude (FDD)

Terra data tracking: lposun.larc.nasa.gov/ceresweb/available_Terra/available_Terra.html



CERES PGE Sizes as Delivered to LaRC DAAC - March 2000

Working Group (Subsystem)	Delivery Date	Number of Lines				
		Source (w/ comments)	Source (executable)	Scripts	SMF/ PCF	MCF
Instrument (1.0)	11/19/99	136868	100977	14595	3508	4901
ERBE-like (2.0 & 3.0)	03/28/00	79087	37332	10932	102	10150
Clouds (4.1-4.4)	12/01/99	136280	106968	6035	2164	5502
Inversion (4.5-4.6)	06/13/99	16279	9559	1494	393	1468
SARB (5.0) (12.0)	03/22/99 03/24/00	35539 20184	22144 9559	1693 1731	136 297	1468 700
TISA (6.0 & 9.0) (7.1, 8.0, & 10.0) (11.0)	09/21/99 10/01/99 11/19/99	40325 53811 30072	25635 33224 20997	5814 2626 5535	11839 61 3278	4200 5950 1400
System (CERESlib)	03/28/00	68810	38364	6477	304	687
System Total		617255	404759	56932	22082	36426

An additional 565,000 lines of code in use at the SCF for validation and analysis

CERES Data Products available at Langley DAAC

http://eosweb.larc.nasa.gov/PRODOCS/ceres/table_ceres.html

You must log in to Web Ordering Tool with your CERES Science Team name and password

Product	Sampling Strategy	Comments	When?
BDS	TRMM-PFM_Edition1	Data after 3/15/00 must be reprocessed after noise fixed	4/99
	Terra-FM1_Alpha Terra-FM2_Alpha	At-launch version. No scan-dependent offsets. Slow-mode filter coefficients need tuning. 'Beta' quality.	4/00
	Terra-FMx_Edition1	Ground determined offsets. Filter/conversion coefficients	August?
ES8 ES9 ES4	TRMM-PFM_Edition1	Superceded by Edition2	10/98
	TRMM- PFM_TransientOps2	Limited turn-on periods from 9/1/98-2/25/00. ES8 only, mainly for ScaRaB and INDOEX comparisons	12/99
	TRMM-PFM_Edition2	Slope-intercept, day/night spectral correction	4/00
	Terra-FM1_Beta Terra-FM2_Beta	At-launch version. Preliminary spectral throughput	4/00
	Terra-FMx_Edition1	Revised spectral correction coefficients	August?
SSF CRS FSW SFC SRBAVG	TRMM-PFM- VIRS_ValidationR3	January 1998 only Superceded by ValidationR4	3/99
	TRMM-PFM- VIRS_ValidationR4	Full 8 months of SSF's, Jan '98 for other products. Summer '99 cloud algorithms. VIRS Release 4 data. VIRS12A ADM's. Partial Earth view footprints.	7/99
	TRMM-PFM- VIRS_Edition1	SSF as agreed at this meeting Another version for CRS, FSW, SFC, SRBAVG	Fall?

Some URL's

CERES home page with links to DAAC, documentation, quick-look results

- **http://asd-www.larc.nasa.gov/ceres/ASDceres.html**

Instrument Operations and Housekeeping Data Statistics

- **http://earth-www.larc.nasa.gov/ceresweb/instr_pub.html**

ERBE-like Public Web Page

- **http://earth-www.larc.nasa.gov/erbelike/pub_cdval/**

SARB Working Group

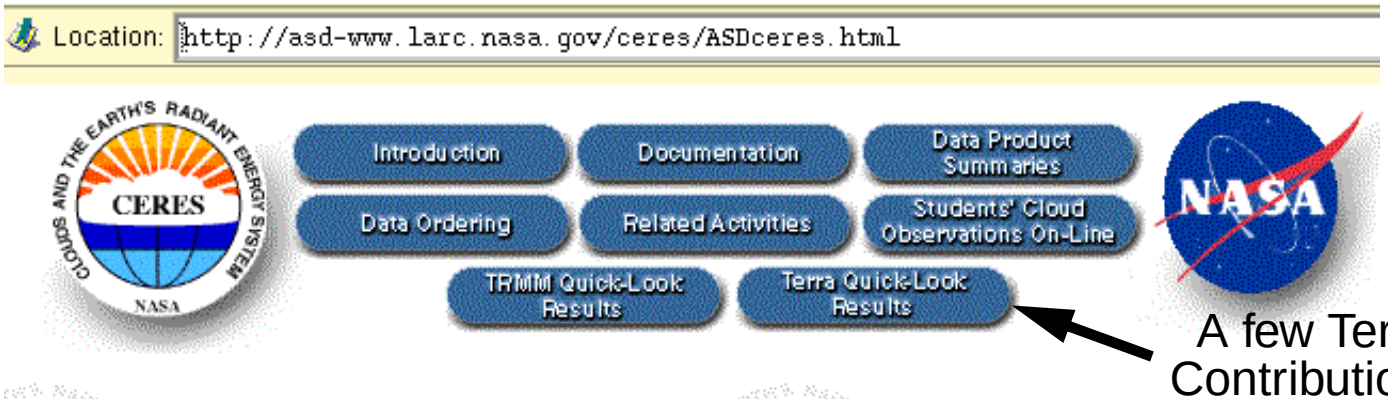
- **http://srbsun.larc.nasa.gov/sarb/**

Surface Properties

- **http://tanalo.larc.nasa.gov:8080/surf_htmls/SARB_surf.html**

Langley DAAC - has link to CERES data order tool and can download view_hdf

- **http://eosweb.larc.nasa.gov/**



A few Terra examples
Contributions welcome!

CERES On-Line Documentation

System Level Documents

- Data Products Catalog – Release 3.2 ← Revised Apr 2000
- Interface Requirements Document: PDF
- External Ancillary Input Data List: PDF – (April 2000)
- Data Management Plan: PDF
- Quality Assessment Plan, Release 3.1: PDF
- Software Coding Guidelines: PDF
- Software Computer Bulletins
- CERESlib
- Configuration Management Home Page

Subsystem Level Documents

- Algorithm Theoretical Basis Documents (**ATBDs**)
- Software Requirements Documents
- Software Design Documents
- Validation Documents
- Release 2 Test Plans
- Operator's Manuals
- Collection Guides ← BDS, ES8; New ES9, ES4, SSF

Data Management Team Materials

- DMT to DAAC Production Requests
- Data Management System Status Presentations ← These slides
- Data Management Team Internal Documents
- Data Management Team Status Reports