



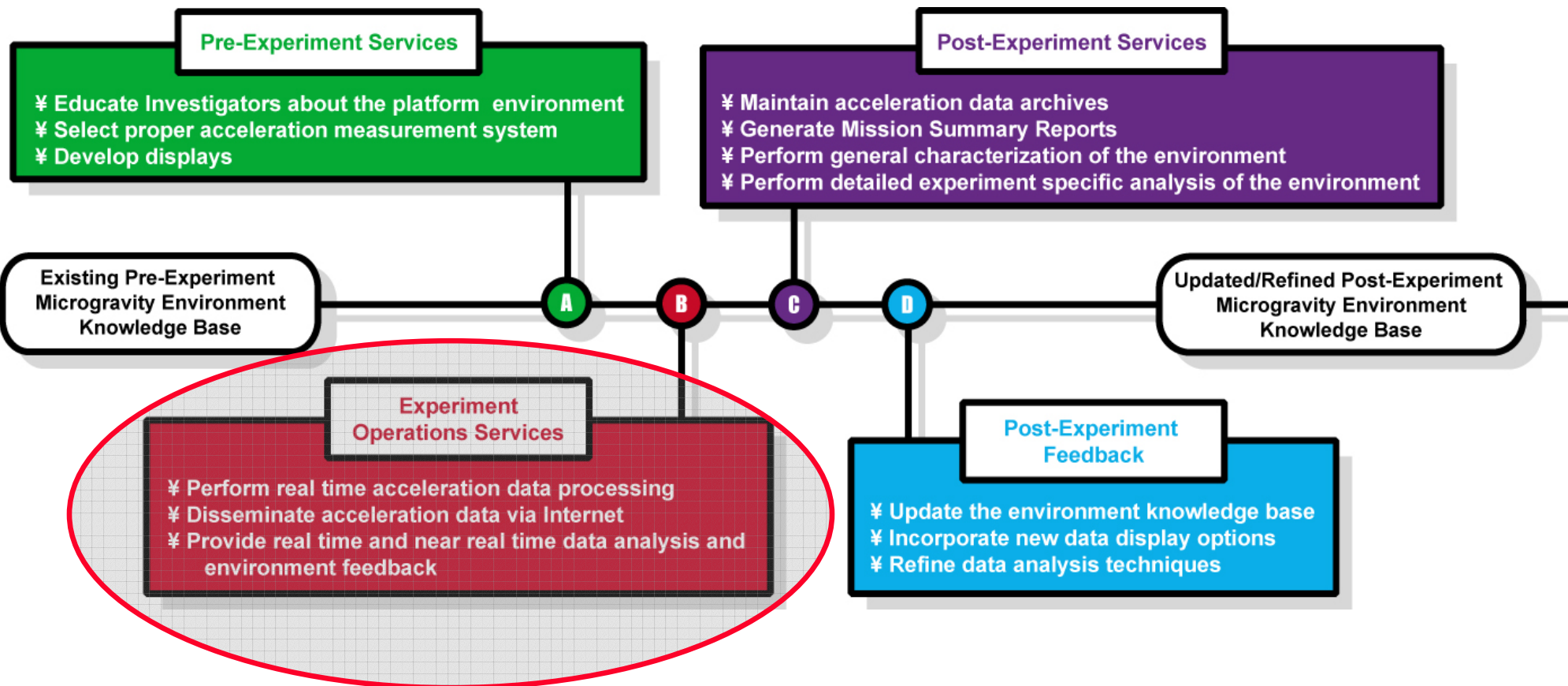
Section 23:
**PIMS International Space Station Operations and
Data Access**

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PIMS Project Manager
NASA Glenn Research Center

Outline

- **Measurement Systems**
- **PIMS Operational Philosophy**
- **PIMS Web Page Functions**
 - **Ancillary Web Page Functions**
 - PIMS Operations Links
 - PIMS Operations Ticker
 - PIMS Sensor Status Bar
 - **Main PIMS Web Page Functions**
 - Acceleration Measurement Home Page
 - PIMS Home Page
 - Current Real Time Plots
 - Current Instrument Locations
 - Access ISS Acceleration Data Archives
 - View Interesting Data Plots
 - ISS Monitoring System
 - Request Data Plots
 - Status Data Plots

PIMS Functions During Experiment Life Cycle



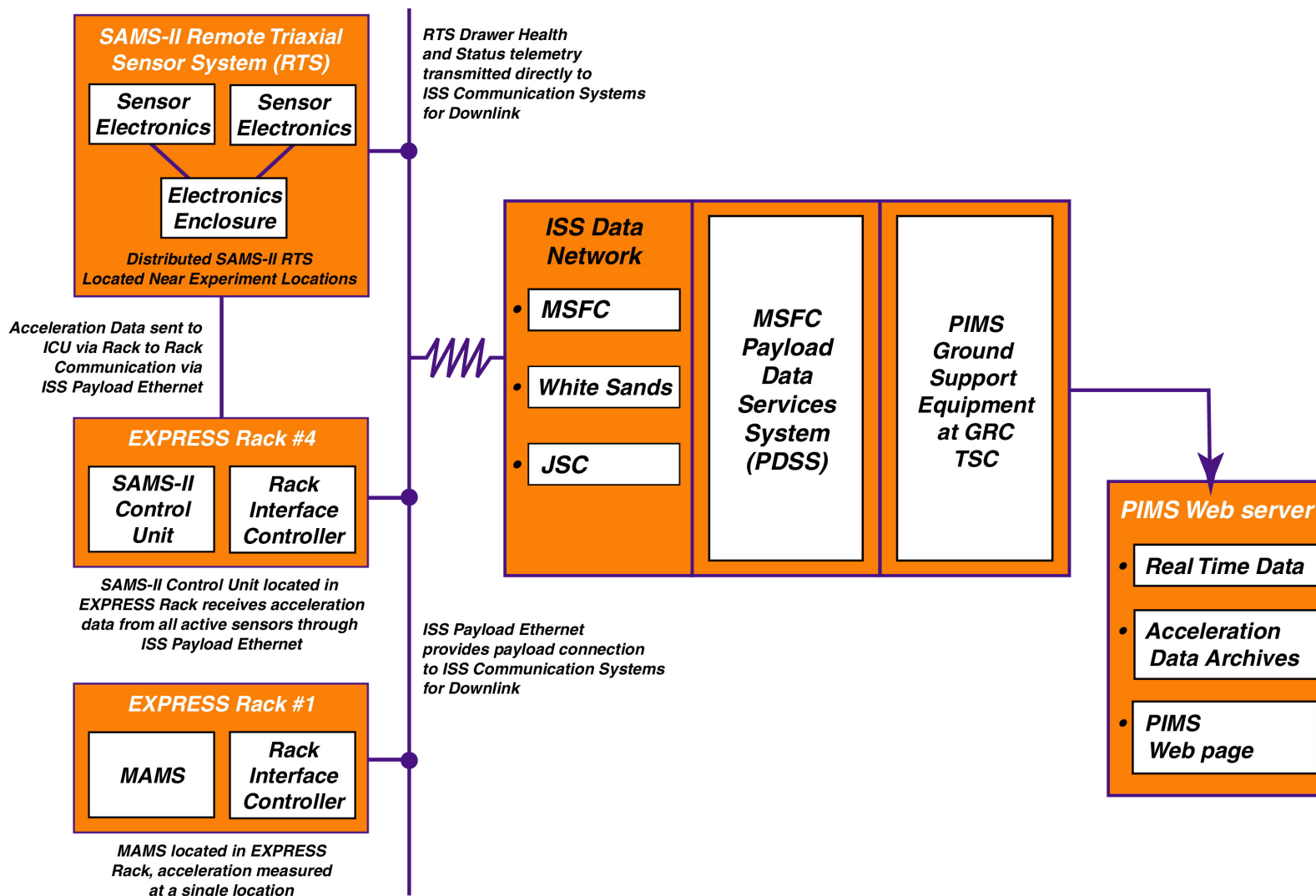
Space Acceleration Measurement System

- **Measure the vibratory and transient acceleration environment ($0.01 \leq f \leq 400$ Hz) on the ISS in support of various microgravity payloads**
 - SAMS RTS
 - MAMS HiRAP
- **Measure the ISS quasi-steady acceleration ($f \leq 0.01$ Hz)**

Components

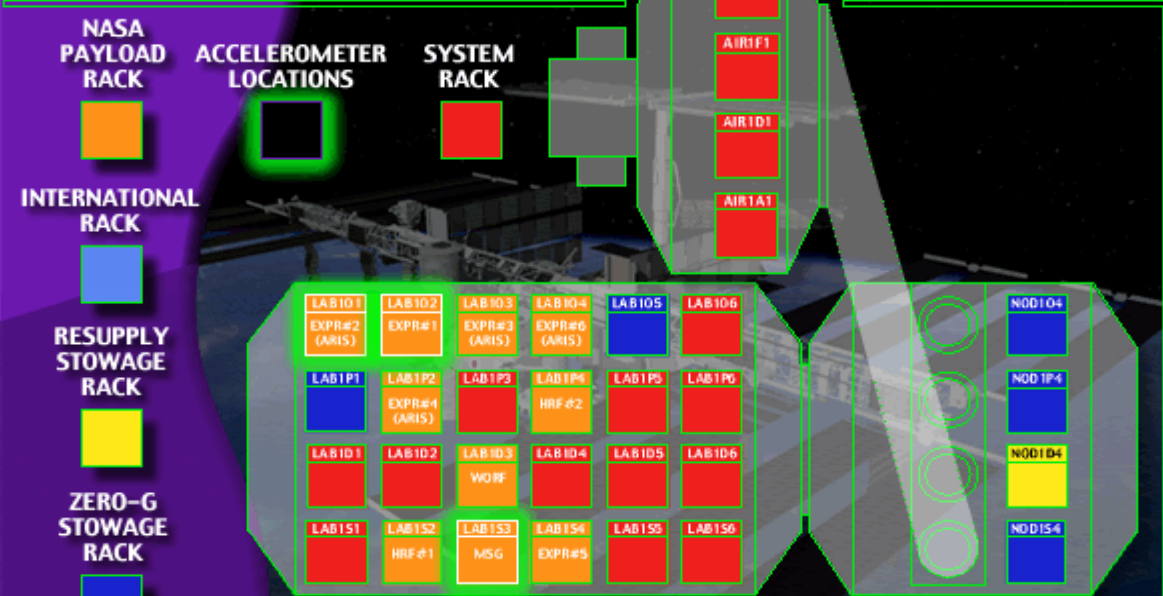
- **MAMS Orbital Acceleration Research Experiment (OARE) Sensor Subsystem (OSS)**
- **Additional features**
 - Quasi-steady acceleration data can be mapped to various locations within the ISS using ISS body rates and body angles
 - Provides on orbit bias calibration capabilities

ISS Acceleration Data Flow for ISS Operations





Current Instrument Locations



- Status Data Plots
- ISS Acceleration Archives
- Current Real-Time Plots
- Interesting Plots
- Acceleration Homepage
- Request Data Plots

PIMS Operational Philosophy

- **Operations are divided into three sections:**
 - **1) Real-time operations**
 - **2) Near real-time operations**
 - **3) Off-line operations**
 - general characterization and specialized analyses
- **Acceleration measurement using SAMS and MAMS began with ISS Flight 6A (April 19, 2001) and is planned for the duration of ISS operations**
- **Potential for nearly continuous operations to characterize the environment**
 - **includes measurement of the environment, where possible, outside of “microgravity mode”**

Operational Philosophy

- **Operational configuration calls for multiple SAMS Sensor Enclosures (SE), MAMS OSS, and MAMS HiRAP**
 - not all sensors will be active all the time resulting in a variety of acceleration measurement profiles
 - **SAMS sensors are operated at PIMS default characterization configuration**
 - Sensors 121f02 (in RTS drawer in ER#1) and 121f05 (ER#2 light tray) operate at 100 Hz and are “continuously on”
 - Sensors 121f03 (ER#2 Z-panel) and 121f04 (ER#1 Z-panel) operate at 200 Hz and are “continuously on”
 - Sensor 121f08 (MSG sensor) operates at 25 Hz in support of SUBSA and PFMI investigations
 - **MAMS operations**
 - MAMS OSS sensor is located in ER#1 and is “continuously on”
 - MAMS HiRAP sensor is active continuously, but is only archived for “significant” microgravity events (docking, undockings, reboots, etc.)

Operational Philosophy

- **AOS/LOS profiles call for 30 - 60 percent AOS coverage**
 - requires the ability to deal with AOS and LOS data streams
 - **ISS attitude (XPOP vs. LVLH greatly affects the AOS/LOS profiles)**
 - XPOP characterized by longer, but less frequent AOS intervals
 - LVLH characterized by shorter, but more frequent AOS intervals
 - **AOS/LOS affects the availability of processed acceleration data as PIMS ground software must wait for HCOR dumps to send LOS data**
 - SAMS and MAMS HiRAP data are available in the PIMS Acceleration Data (PAD) archives with a 24 hour delay
 - MAMS OSS data are available in the PIMS Acceleration Data (PAD) archives with a 30 hour delay

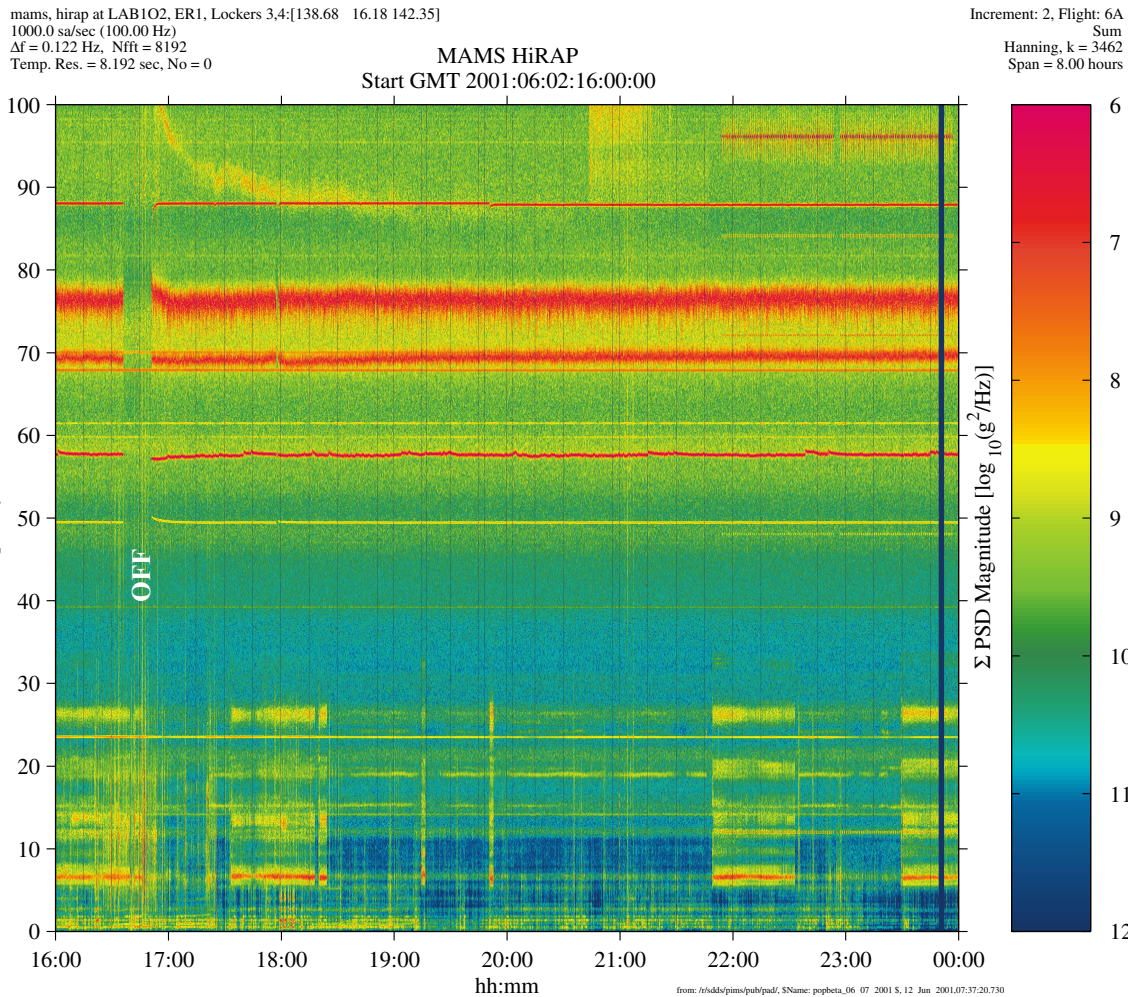
Operational Philosophy

- **PIMS has developed a core set of techniques for processing and displaying the acceleration data (see Section 12 for quasi-steady data and Section 13 for vibratory data)**
 - **Based on real-time and offline experience gained from SAMS and OARE data during Space Shuttle and Mir operations**
 - **PIMS utilizes its core set of analysis techniques for processing and analyzing the acceleration data offline**
 - Real-time data provides clues, but offline analysis provides details ISS microgravity environment characterization function
 - Customized processing or displays as required by the microgravity user community
- **Microgravity acceleration data is available to Principal Investigators in near real time and offline through the WWW**
 - **<http://pims.grc.nasa.gov>**

Real-Time Operations

- **Crux of PIMS Real-time Operations is the Distribution of Acceleration Data Displays via the WWW**
 - **PIMS displays are updated in real-time and electronic snapshots are routed to the PIMS WWW page**
 - **SAMS sensor 121f02-121f05 typically have only color spectrogram active**
 - Color spectrogram provides best plot for aiding PIMS general characterization activities
 - **SAMS sensor 121f08 utilizes color spectrogram and interval minimum/maximum plot type per specific user requirements**
 - **MAMS OSS sensor shows time domain plot, typically shown at sensor location, ISS CG, and MSG location**
 - **MAMS HiRAP sensor typically has only color spectrogram active**
 - Color spectrogram provides best plot for aiding PIMS general characterization activities

ADVanced ASTroCulture (ADVASC) Experiment Equipment Qualify



Data Description	
Sensor	HiRAP 1000.0 sa/sec (100.00 Hz)
Location	LAB1O2, ER1, Lockers 3,4
Inc/Flight	Increment: 2, Flight: 6A
Plot Type	spectrogram

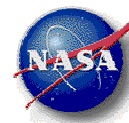
Notes:

- ADVASC experiment equipment* :
 - **pump** – narrowband signal centered at about 53.5 Hz
 - **2 fans** – narrowband signals centered at about 48 and 88 Hz.
 - **2 blowers** – broadband signals centered at about 72 and 78 Hz

* as confirmed by ADVASC team at University of Wisconsin



Microgravity Science Division



Glenn Research Center

PIMS ISS Acceleration Handbook
 Date last modified 10/1/02

Regime:	Vibratory
Category:	Experiment Equipment
Source:	ADVanced ASTroCulture (ADVASC)

MEIT 2004 Figure 23-1: HiRAP Spectrogram of ADVASC Deactivation

Near Real-Time Operations

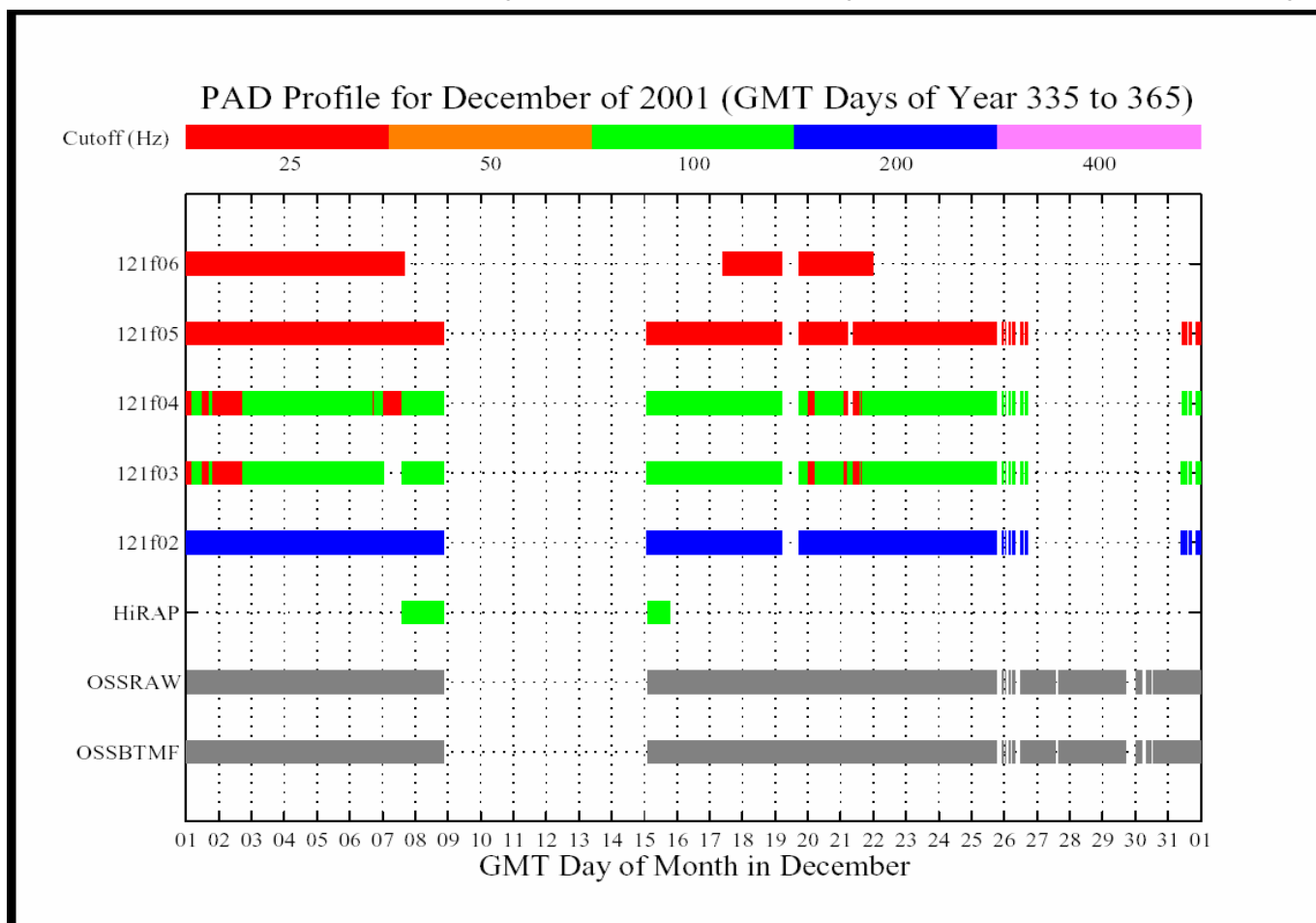
- **Two primary functions performed**
 - Merge AOS and LOS data streams
 - Generate processed (t,x,y,z) data files stored in common format
- **Standard storage format details**
 - **Represents a standard file format for ISS acceleration data from any ISS acceleration measurement system, including ancillary data associated with each accelerometer**
 - Ancillary data describes the conditions and circumstances under which the acceleration data were obtained
 - current ancillary data parameters include: t-zero, sampling rate, cutoff frequency, head ID, gain, station configuration, location, orientation, coordinate system, bias coefficients, scale factor, and Data Quality Measure (DQM)
 - SIMPLIFY ACCESS TO ACCELERATION DATA FOR PRINCIPAL INVESTIGATORS
 - **PIMS-ISS-101 ISS PIMS Acceleration Data (PAD) File Description Document details the PAD storage format**
 - http://pims.grc.nasa.gov/reports/PIMS-ISS-101_revBaseline.pdf

Off-line Operations

- **Primary function is to allow access to acceleration data for non-time-critical processing**
 - In general, allows a more detailed analysis of the measured microgravity environment
 - Capable of processing and analyzing a long period of data
 - Overall access to acceleration data greatly simplified by a universal storage format
- **PIMS WWW page offline functions**
 - Provide the capability to request plotted data or data files through an electronic request
 - Provide means for access to the processed acceleration data files
 - Provide access to PIMS disturbance database information

PIMS Acceleration Data (PAD) File

- **Direct access to the PAD files through PIMS ISS web site**
 - <http://pims.grc.nasa.gov/html/ISSAccelerationArchive.html>
 - Link provides instructions for downloading acceleration data files via FTP
 - PAD profile exist for every month to quickly show data availability

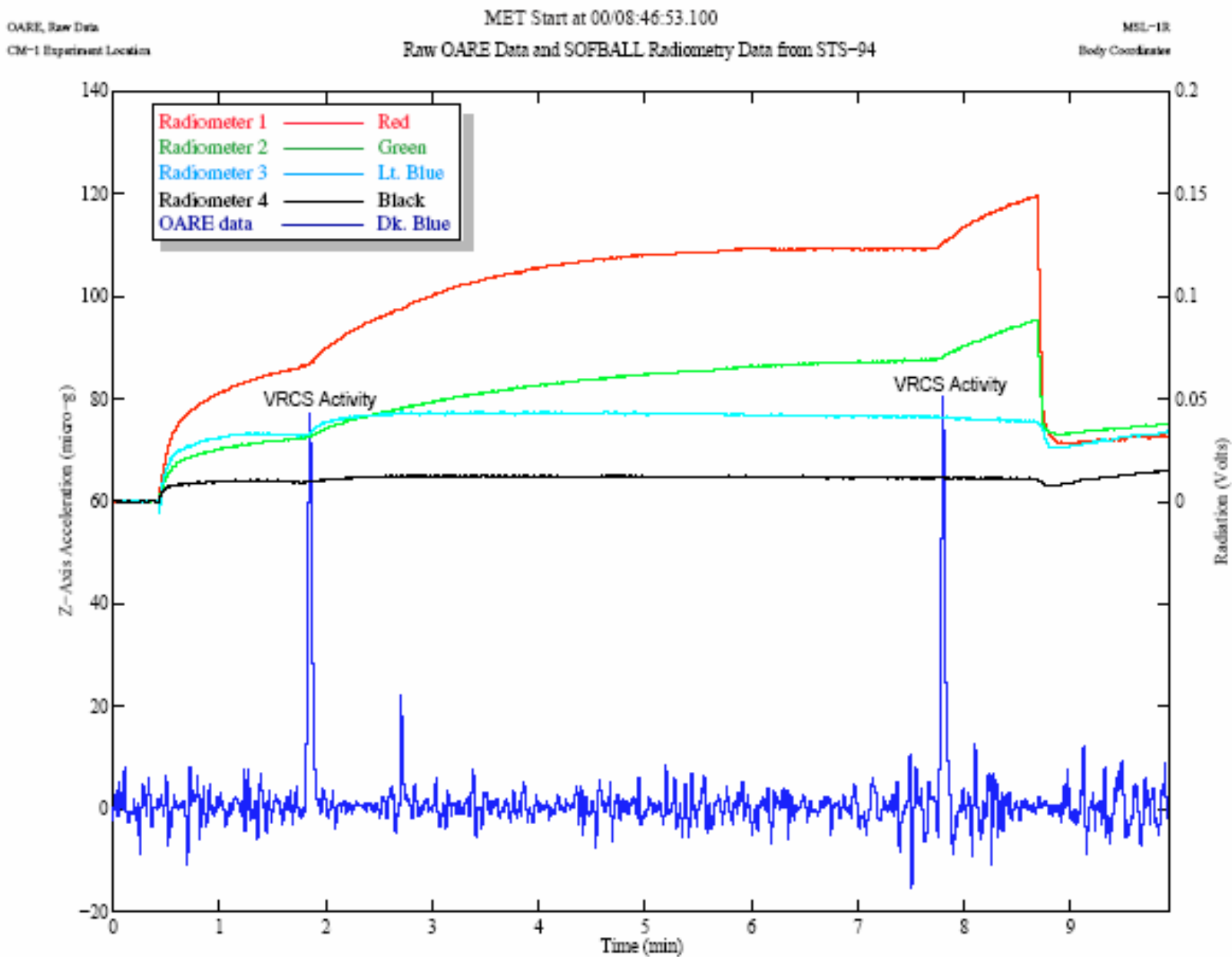


PIMS Acceleration Data (PAD) File

- **Sensor and time based data hierarchy**
 - **Typical directory path:**
 - /year2002/month05/day25/sams2_accel_121f02
 - Sensor type/name at the lowest level of the directory structure
- **Filenames contain start and stop time of the acceleration data within the file**
 - **2002_09_13_01_10_29.287+2002_09_13_01_20_29.292.121f03**
 - First data point at September 13, 2002, 01:10:29.287 and last data point at September 13, 2002, 01:20:29.292
 - + sign indicates data in this file are contiguous in time and no change in the ancillary data with the previous data file
 - - sign indicates data are not contiguous in time or a change in ancillary data has occurred

PIMS Acceleration Data (PAD) File

- **Typical file break examples for PAD file data**
 - **Time gap**
 - Typically results from dropped packet in the data network. At cutoff frequency of 200 Hz, SAMS transmits 8 packets per second. Loss of a single packet will generate a time gap.
 - Data packets between MSFC and GRC are transmitted via UDP, an asynchronous protocol that will have packet loss.
 - **Sample rate change**
 - Operationally, SAMS sensor could support multiple experiments with different acceleration data cutoff frequency requirements
 - Changes in sampling rate/cutoff frequency close the current data file at one sampling rate and open a new file at the new sampling rate
 - **ISS configuration change**
 - The station configuration parameter provides a gross measure of time to indicate when acceleration data were obtained
 - As Shuttle leaves the ISS, the station configuration parameter is updated to reflect the new ISS stage/increment



MEIT 2004 Figure 23-2: Raw OARE Data and SOFBALL Radiometry Data from STS-94 (MSL-1R)

Ancillary PIMS ISS Web Page Functions

- **PIMS ISS Operations Links**
 - Provides current GMT timestamp
 - Provides links to latest PIMS data and important information
 - Tutorial information
 - Increment reports
 - Specialized analysis
 - PI questionnaire
- **PIMS ISS Operations Ticker**
 - Provides current ISS status information
- **PIMS Sensor Status Bar**
 - Provides description of current acceleration data measurement activity
 - Provides current GMT, last data packet received time, AOS/LOS indication and sensor sampling rate

GMT Time

297 Days 22:41:42

PIMS ISS Operations Links

- [2002 Microgravity Environment Interpretation Tutorial \(MEIT\)](#)
- [PI Questionnaire](#)
- [PIMS PMWG](#)
- [PIMS ISS 001 REV B](#)
- [PIMS ISS Increment Reports](#)

Search the PIMS International Space Station Web Site

Search!



Responsible NASA person: Kevin McPherson pimsops@grc.nasa.gov

Principal Investigator Microgravity Services International Space Station

Welcome to the Principal Investigator Microgravity Services (PIMS) International Space Station Website

Click on the appropriate button to access the page you would like to view

PIMS on ISS

539 Days 06:41:42

PIMS ISS Operations Ticker

Expedition also were moved to Atlantis and stored for return. A Protein Crystal Growth Single Thermal Enclosure System (PCG-STES) growth chamber with space-grown crystals was stored in the Shuttle middeck for return and swapped places in the Destiny lab with another crystal growth unit ferried up by the

Click [here](#) to view all available sensors

Click [here](#) to view current ISS SAMS/MAMS plots

GMT of the most recent status snap | name of the sensor | current sensor status

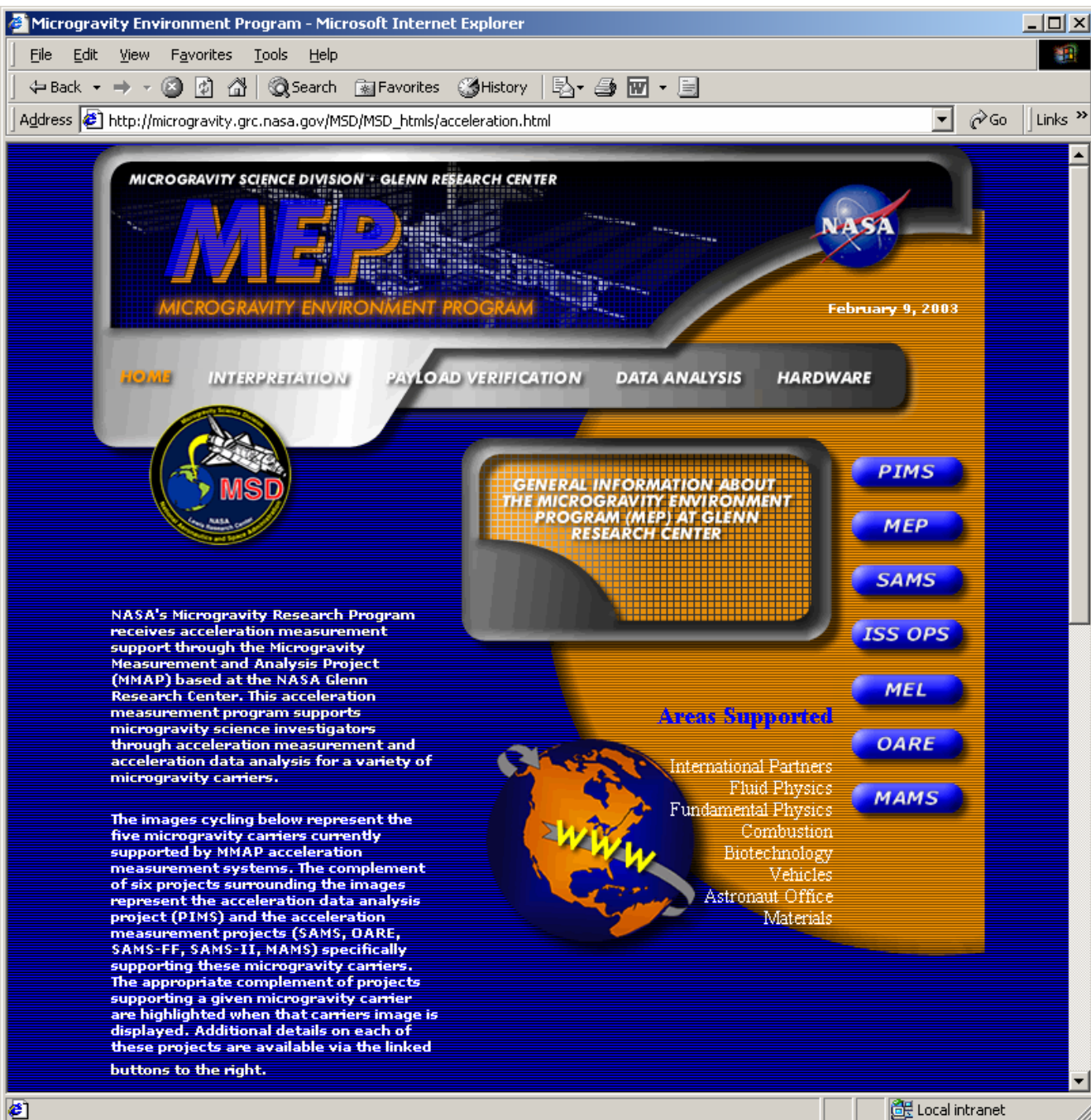
Curr. GMT=297/22:40:13 GMT of Last packet=297/21:23:58 121F03@200HZ ON HOST:GONZALEZ IS ACTIVE (LOS)

The ticker above shows the current available sensor status

[PIMS Operations Schedule](#)

[Privacy Statement](#)

This page maintained by: Tim Rekart, [Zin Technologies, Inc.](#) tim.rekart@grc.nasa.gov



MICROGRAVITY SCIENCE DIVISION • GLENN RESEARCH CENTER

MEP

MICROGRAVITY ENVIRONMENT PROGRAM

February 9, 2003

[HOME](#) [INTERPRETATION](#) [PAYLOAD VERIFICATION](#) [DATA ANALYSIS](#) [HARDWARE](#)

GENERAL INFORMATION ABOUT THE MICROGRAVITY ENVIRONMENT PROGRAM (MEP) AT GLENN RESEARCH CENTER

[PIMS](#)
[MEP](#)
[SAMS](#)
[ISS OPS](#)
[MEL](#)
[OARE](#)
[MAMS](#)

Areas Supported

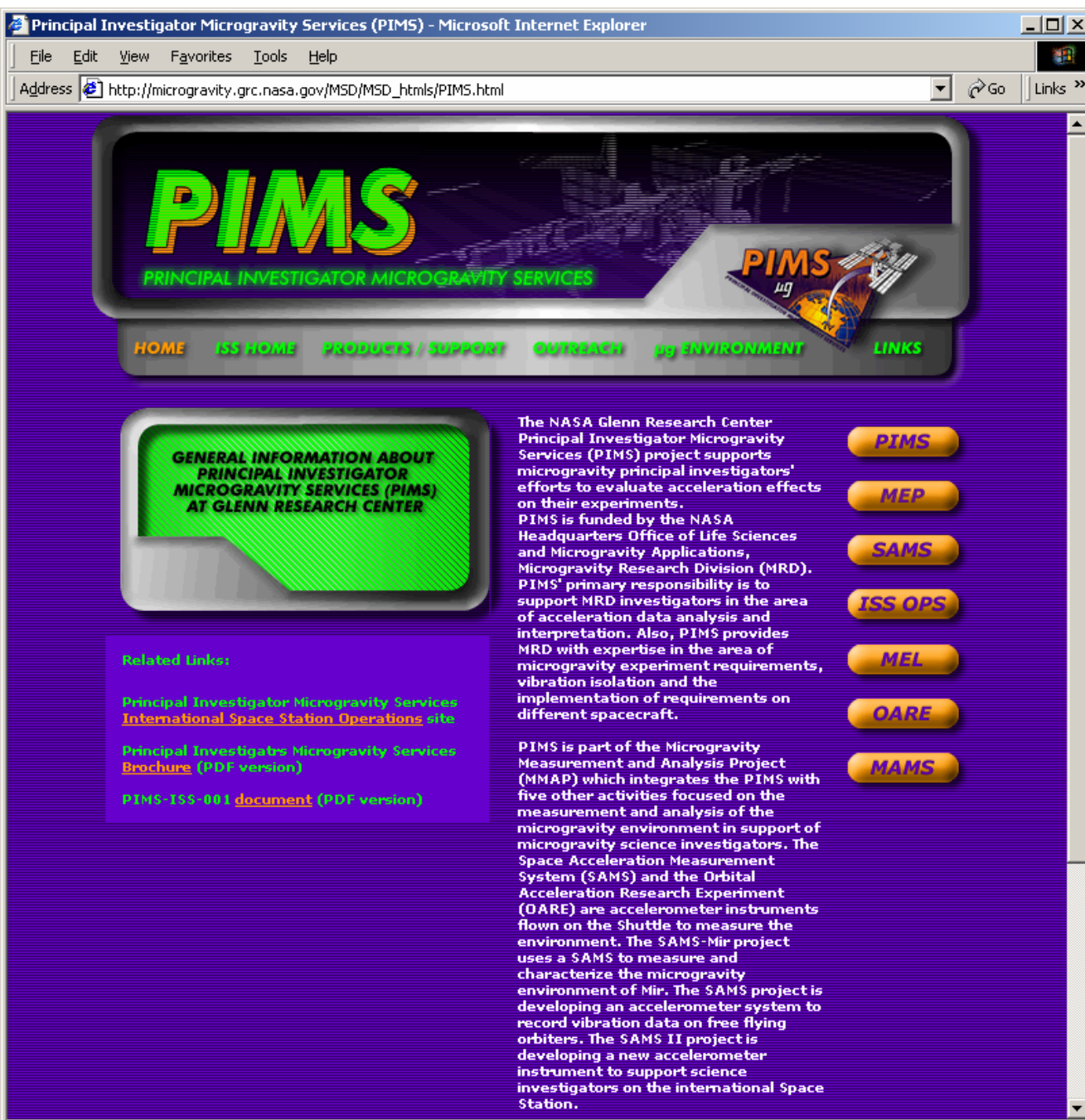
- International Partners
- Fluid Physics
- Fundamental Physics
- Combustion
- Biotechnology
- Vehicles
- Astronaut Office
- Materials

NASA's Microgravity Research Program receives acceleration measurement support through the Microgravity Measurement and Analysis Project (MMAP) based at the NASA Glenn Research Center. This acceleration measurement program supports microgravity science investigators through acceleration measurement and acceleration data analysis for a variety of microgravity carriers.

The images cycling below represent the five microgravity carriers currently supported by MMAP acceleration measurement systems. The complement of six projects surrounding the images represent the acceleration data analysis project (PIMS) and the acceleration measurement projects (SAMS, OARE, SAMS-FF, SAMS-II, MAMS) specifically supporting these microgravity carriers. The appropriate complement of projects supporting a given microgravity carrier are highlighted when that carrier's image is displayed. Additional details on each of these projects are available via the linked buttons to the right.

Main PIMS Web Page Functions

- Acceleration Measurement Home Page
 - Provides links to the various acceleration measurement systems supported by the Microgravity Environment Program



Principal Investigator Microgravity Services (PIMS) - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address http://microgravity.grc.nasa.gov/MSD/MSD_htmls/PIMS.html Go Links >>

PIMS

PRINCIPAL INVESTIGATOR MICROGRAVITY SERVICES

HOME ISS HOME PRODUCTS / SUPPORT OUTREACH ENVIRONMENT LINKS

GENERAL INFORMATION ABOUT PRINCIPAL INVESTIGATOR MICROGRAVITY SERVICES (PIMS) AT GLENN RESEARCH CENTER

The NASA Glenn Research Center Principal Investigator Microgravity Services (PIMS) project supports microgravity principal investigators' efforts to evaluate acceleration effects on their experiments. PIMS is funded by the NASA Headquarters Office of Life Sciences and Microgravity Applications, Microgravity Research Division (MRD). PIMS' primary responsibility is to support MRD investigators in the area of acceleration data analysis and interpretation. Also, PIMS provides MRD with expertise in the area of microgravity experiment requirements, vibration isolation and the implementation of requirements on different spacecraft.

PIMS is part of the Microgravity Measurement and Analysis Project (MMAP) which integrates the PIMS with five other activities focused on the measurement and analysis of the microgravity environment in support of microgravity science investigators. The Space Acceleration Measurement System (SAMS) and the Orbital Acceleration Research Experiment (OARE) are accelerometer instruments flown on the Shuttle to measure the environment. The SAMS-Mir project uses a SAMS to measure and characterize the microgravity environment of Mir. The SAMS project is developing an accelerometer system to record vibration data on free flying orbiters. The SAMS II project is developing a new accelerometer instrument to support science investigators on the international Space Station.

Related Links:

- [Principal Investigator Microgravity Services International Space Station Operations site](#)
- [Principal Investigator Microgravity Services Brochure \(PDF version\)](#)
- [PIMS-ISS-001 document \(PDF version\)](#)

PIMS
MEP
SAMS
ISS OPS
MEL
OARE
MAMS

Main PIMS Web Page Functions

- Principal Investigator Microgravity Services Home Page
 - Provides link to electronic copy of the PIMS brochure
 - Provides link to PIMS-ISS-001 document which describes the capabilities of the PIMS ISS software systems
- Provides links to various other PIMS products and services

Main PIMS Web Page Functions

- **Current Real Time Plots**
 - **Provides access to real time data plots based on acceleration measurement system, sensor, and plot types**
 - **Mouse over this button to get the acceleration measurement system menu**
 - **Select the sensor from the desired acceleration measurement system**
 - **Select the plot type for the sensor of interest**
 - **If a plot type is not available (not actively being generated by PIMS real time software), a message is displayed to contact PIMS if that plot type is desired**

GMT Time

297 Days 23:30:12

PIMS ISS

Operations Links

- [2002 Microgravity Environment Interpretation Tutorial \(MEIT\)](#)
- [PI Questionnaire](#)
- [PIMS PMWG](#)
- [PIMS ISS 001 REV B](#)
- [PIMS ISS Increment Reports](#)

Search the PIMS International Space Station Web Site

Search!



Principal Investigator Microgravity Services International Space Station

Request Data Plots

Current Instrument Locations

Status Data Plots

View Interesting Data Plots

Current Real-Time Plots

ISS µg Monitoring System

PIMS Home Page

Acceleration Measurements Home Page

Access Acceleration Data Archive

SAMS-II

HEAD 121_0	Acceleration vs. Time
MAMS HIRA	Interval Min/Max vs. Time
MAMS OSS	Interval Average Acceleration vs. Time
HEAD 121_0	PSD vs. Frequency
HEAD 121_0	Color Spectrogram
HEAD 121_0	Cumulative RMS vs. Frequency
HEAD 121_0	RMS Acceleration vs Time for Selected Frequency Bands
HEAD 121_0	One Third Octave

Welcome to the Principal Investigator Microgravity Services (PIMS) International Space Station Website

Click on the appropriate button to access the page you would like to view

PIMS on ISS

539 Days 07:30:12

PIMS ISS

Operations Ticker

Also on Sunday, the crew performed a post-spacewalk reading on the EVARM dosimeter badges worn by Wolf and Sellers on their second spacewalk to continue installing the S1 Truss to the Station.

On Monday, selected members of the Station crew filled out their weekly Crew Interactions survey on the Busset.

[Click here to view all available sensors](#)

[Click here to view current ISS SAMS/MAMS plots](#)

GMT of the most recent status snap | name of the sensor | current sensor status

Curr. GMT=297/23:28:14 GMT of Last packet=297/22:56:13 121F02@100HZ ON HOST:FINLEY IS ACTIVE (LOS)

The ticker above shows the current available sensor status

[PIMS Operations Schedule](#)

GMT Time

304 Days 14:23:38

PIMS ISS
Operations Links

- [2002 Microgravity Environment Interpretation Tutorial \(MEIT\)](#)
- [PI Questionnaire](#)
- [PIMS PMWG](#)
- [PIMS ISS 001 REV B](#)
- [PIMS ISS Increment Reports](#)

Search the PIMS International Space Station Web Site

Search!

Principal Investigator Microgravity Services International Space Station

Current Instrument Locations

- Request Data Plots
- View Interesting Data Plots
- ISS μ g Monitoring System
- Current Real-Time Plots
- PIMS Home Page
- Acceleration Measurement Home Page

Request Data Plots

- SAMS-II
- MAMS HIRAP
- MAMS OSS
- Acceleration vs. Time
- Interval Min/Max vs. Time
- Interval Average Acceleration vs. Time
- TMF Acceleration vs. Time
- MAMS OSS B Bias Data vs. Time
- MAMS OSS C Bias Data vs. Time

View Interesting Data Plots

- SUBSA
- CG
- OSS
- ML

Welcome to the Principal Investigator Microgravity Services (PIMS) International Space Station Website

Click on the appropriate button to access the page you would like to view

PIMS on ISS

545 Days 22:23:38

PIMS ISS
Operations Ticker

attention was turned to the arrival of two upcoming missions to the International Space Station. The first set of visitors, the Soyuz Five Taxi Flight crew, is scheduled to launch at 9:11 p.m. CST Oct. 29 (0311 GMT Oct. 30) and dock with the station two days later, delivering a new Soyuz spacecraft that will serve as the station's crew return vehicle.

[Click here to view all available sensors](#)

[Click here to view current ISS SAMS/MAMS plots](#)

GMT of the most recent status snap | name of the sensor | current sensor status

Curr. GMT=304/14:22:56 GMT of Last packet=304/14:07:38 121F05@100HZ ON HOST:BRANYAN IS ACTIVE (LOS)

The ticker above shows the current available sensor status



Main PIMS Web Page Functions

- **Current Instrument Locations**
 - **Contains a drawing of the US Lab, designating payload racks, system racks, and stowage racks**
 - **Racks containing acceleration measurement system hardware are ghosted in green**
 - **Mousing over a ghosted rack brings up the same menu selections as for the Current Real Time Plots link**
 - Provides access to real time data plots based on acceleration measurement system, sensor, and plot types
 - Mouse over this button to get the acceleration measurement system menu
 - Select the sensor from the desired acceleration measurement system
 - Select the plot type for the sensor of interest
 - **If a plot type is not available (not actively being generated by PIMS real time software), a message is displayed to contact PIMS if that plot type is desired**



Current Instrument Locations

Legend:

- NASA PAYLOAD RACK (Orange)
- ACCELEROMETER LOCATIONS (Black)
- SYSTEM RACK (Red)
- INTERNATIONAL RACK (Blue)
- RESUPPLY STORAGE RACK (Yellow)
- ZERO-G STORAGE RACK (Dark Blue)

Assembly Sequence 11A Instrument Locations:

LAB101 EXPR#2 (ARIS)	LAB102 EXPR#1	LAB103 EXPR#3 (ARIS)	LAB104 EXPR#6 (ARIS)	LAB105	LAB106
LAB1P1	LAB1P2 EXPR#4 (ARIS)	LAB1P3	LAB1P6 HRF #2	LAB1P5	LAB1P6
LAB1D1	LAB1D2	LAB1D3 WORF	LAB1D4	LAB1D5	LAB1D6
LAB1S1	LAB1S2 HRF#1	LAB1S3 MSG	LAB1S4 EXPR#5	LAB1S5	LAB1S6

Vertical Racks:

- AIR101
- AIR1F1
- AIR1D1
- AIR1A1

Other Locations:

- NOD1O4
- NOD1P4
- NOD1D4
- NOD1S4

Navigation Buttons:

- Status Data Plots
- ISS Acceleration Archives
- Current Real-Time Plots
- Interesting Plots
- Acceleration Homepage
- Request Data Plots



Current Instrument Locations

NASA PAYLOAD RACK

ACCELEROMETER LOCATIONS

SYSTEM RACK

INTERNATIONAL RACK

RESUPPLY STORAGE RACK

ZERO-G STORAGE RACK

LAB101 **LAB102** **LAB103** **LAB104** **LAB105** **LAB106** **NOD104**

LAB1P1 **LAB1D1** **LAB1S1** **LAB1S2** **LAB1S3** **LAB**

EXPR#2 (ARIS) **EXPR#1** **EXPR#3** **EXPR#6** **HRF#1** **MSG** **EXPR#5**

SAMS II

MAMS HIRAI

MAMS OSS

HEAD 121_f0

HEAD 121_f0

HEAD 121_f0

HEAD 121_f0

11A - Assembly Sequence

Acceleration vs. Time

Interval Min/Max vs. Time

Interval Average Acceleration vs. Time

PSD vs. Frequency

Color Spectrogram

Cumulative RMS vs. Frequency

RMS Acceleration vs Time for Selected Frequency Bands

One Third Octave

Status Data Plots

ISS Acceleration Archives

Interesting Plots

Acceleration Homepage

Main PIMS Web Page Functions

- **Access ISS Acceleration Data Archives**
 - **This link provides instructions on how to downlink acceleration data files and their associated header files. Details of the PIMS Acceleration Data (PAD) file directory structure and file formats are contained in the document PIMS-ISS-101, ISS PIMS Acceleration Data (PAD) File Description Document**
 - **First step is to determine data availability using monthly data availability profiles assembled by PIMS data analysts**
 - **Second step is to verify the ability to properly read PAD binary data files by downloading the appropriate file pair below, either for four column binary data or six column binary data. For MAMS OSS raw data, download the six column example files. For all other data (SAMS, MAMS filtered data, MAMS HiRAP), download the four column example files**
 - Download a pair of test files, an actual binary data file and an Excel spreadsheet containing the first 20 records of that file
 - Use your binary data file reader to read the first 20 records of the binary data file
 - Open the associated spreadsheet data file spreadsheet and compare the resultant data
 - When the results are identical, proceed to steps for downloading desired data from the time period and sensor of interest

ISS Acceleration Data Archives

ON-LINE ACCESS TO PIMS ACCELERATION DATA ARCHIVE

Acceleration data measured by the MAMS and the SAMS acceleration measurement systems on the ISS are available over the Internet via FTP from a NASA GRC file server. The contents of these acceleration data files (PIMS Acceleration Data (PAD) files) and the overall acceleration data archive directory structure are described in the document, International Space Station PIMS Acceleration Data File Description Document ([PIMS-ISS-101](#)). The binary data stored in the PAD binary acceleration data files are stored in binary 32-bit IEEE float little endian format.

There are 4 basic sensor data types available for downloading. Each sensor data type has some handling/use restrictions that need to be employed prior to generating any plots or performing any manipulation of these data. These limitations are described in the table below:

SAMS data	Data must be demeaned to remove any instrument bias
MAMS HiRAP data	Data must be demeaned to remove any instrument bias
MAMS OSS TMF data	No limitations. Data have been trimmean filtered and bias compensated and are ready for use.
MAMS OSS raw data	Recommend not using the data because bias has not been removed and the bias compensation process requires addition data and data processing. If raw MAMS OSS data are desired, contact PIMS at pimsops@grc.nasa.gov

To download acceleration data, follow the steps indicated below to first verify availability of acceleration data for the time period of interest and second to verify the ability to properly read PAD binary data files.

1. Determine the availability of data for time period of interest by checking the PAD profile for the month of interest

[Click Here to get a listing of PAD files for 2001](#)

[Click Here to get a listing of PAD files for 2002](#)

2. Verify the ability to properly read PAD binary data files by downloading the appropriate file pair below. Per PIMS-ISS-101, there are two file formats available: four column binary data and six column binary data. For MAMS OSS raw data, download the six column example files. For all other data download the four column example files.

- A. Download the desired pair of data files below (six column or 4 column)
- B. Use your binary data file reader to read the first 20 records of the binary data file.
- C. Open the associated spreadsheet data file spreadsheet and compare the resultant data.
- D. When the results are identical, proceed to step 3

DOWNLOAD

[SIX COLUMN BINARY DATA](#)

DOWNLOAD

[FOUR COLUMN BINARY DATA](#)

DOWNLOAD

[SIX COLUMN SPREADSHEET DATA](#)

DOWNLOAD

[FOUR COLUMN SPREADSHEET DATA](#)

Download Instructions For Windows Users:

[Explorer](#)

[Netscape](#)

mouseover the appropriate browser to view instructions

Download Instructions For Macintosh Users:

[Explorer](#)

[Netscape](#)

mouseover the appropriate browser to view instructions

3. To access a file, go to: <ftp://pims.grc.nasa.gov/pad/>

Navigate to the desired year/month/day path for the data of interest. If the desired data are not available (/day portion of the path and below are not viewable), please send an email to pimsops@grc.nasa.gov. The desired data have been migrated off the system and need to be restored.

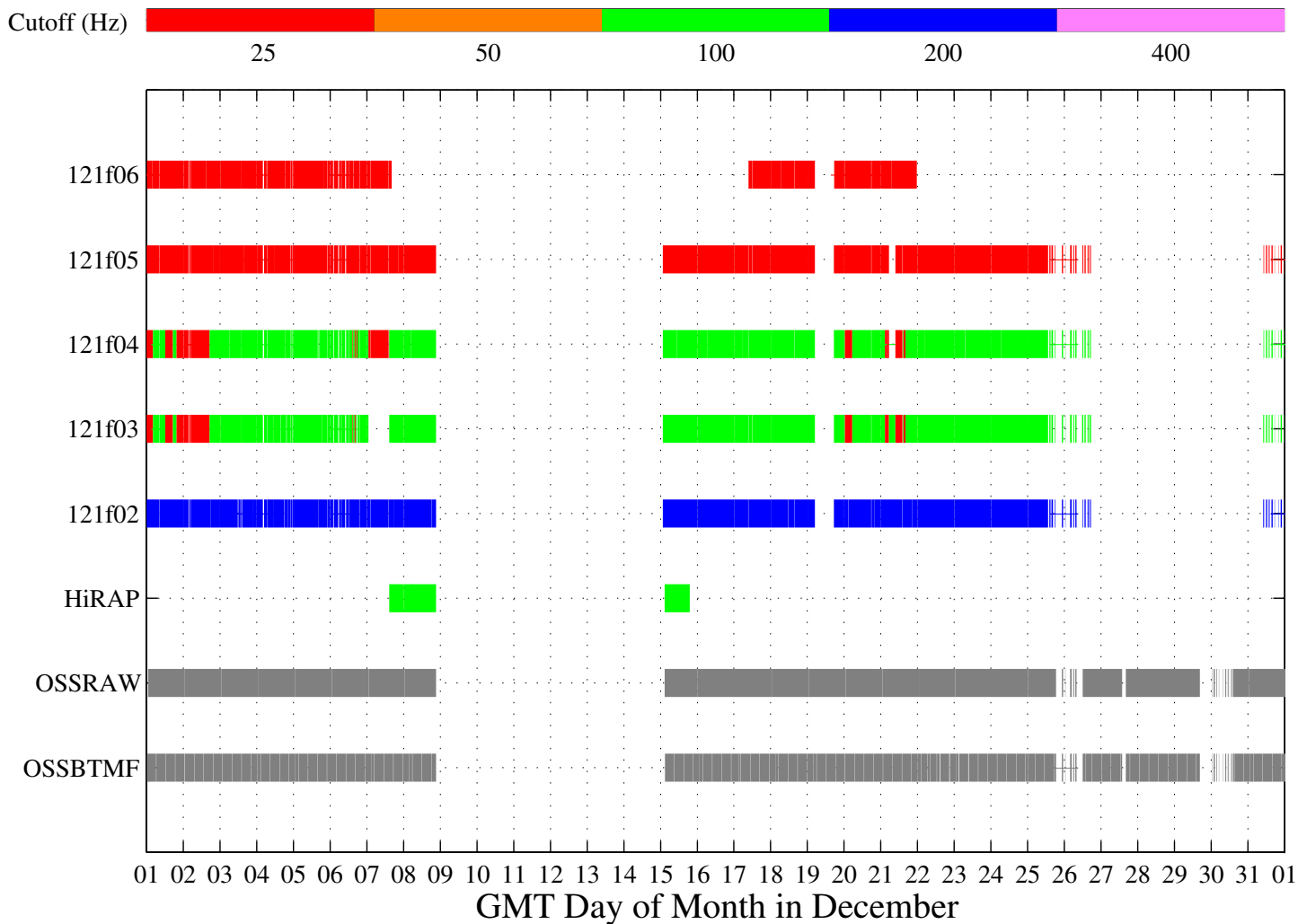
4. Change directory to desired Measurement_System_DataType_SensorID[Data Qualifier] for the sensor of interest.

5. Download data & header file pairs for time frame of interest using GMT time name convention:
Start Time - Stop Time.SensorID[header] where Start/Stop Times are underscore delimited fields:
YYYY_MM_DD_hh_mm_ss.sss
year_month_day_hour_minutes_second

6. If ASCII data are preferred, download the PAD file binary to ASCII converter. [Note: This converter will operate on Windows 98 and NT version 4]

ftp://pims.grc.nasa.gov/pad/Binary2ASCII/PIMS_Bin2ASCII.ZIP

PAD Profile for December of 2001 (GMT Days of Year 335 to 365)



Main PIMS Web Page Functions

- **Coming soon, some major improvements to the PIMS web page**
 - **Generate data plots in near real time**
 - **Submit data requests and status individual data requests**
 - **Query PIMS document database and PIMS microgravity disturbance database**

Summary

- **PIMS has been receiving, processing, and storing acceleration data for SAMS and MAMS data starting with flight 6A operations (May, 2001)**
- **A universal storage format is currently employed for data storage**
 - **simplify access to acceleration data**
 - **standardize formats for data storage to maximize access to all existing acceleration data by international partners**
 - **Described in PIMS-ISS-101 document**
- **Real-time data plots of the various available accelerometers are available via the PIMS WWW page**
- **Offline access to plotted data and analysis capabilities are available through PIMS and the PIMS WWW page**
- **General and specialized characterization of the ISS microgravity environment are provided**