About GUVI Data Products

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Outline

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- Data product development schedule
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- Data product files
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- Data interface and access
- Planning tools

GUVI Data Level Definitions

Data Level	Description
Raw Telemetry	Unprocessed digital telemetry
Level 0	Unprocessed instrument data at full resolution that has been separated by instrument or subsystem
Level 1A	Unprocessed instrument data at full resolution, time referenced and annotated with ancillary information including radiometric and geometric parameters
Level 1B	Level 1A data processed to sensor units (e.g. Rayleighs/color). This is a virtual product – no data files will be produced.
Level 1C	Level 1B radiance data mapped on a uniform, earth-referenced grid
Level 2B	Derived geophysical variables at the resolution of retrieval
Level 3	Derived geophysical variables mapped on a uniform, earth-referenced, space-time grid
Survey	Summary or low fidelity data used for quicklook or data mining
Status	Reports and/or timelines describing planning or status information

GUVI Level 1 & 2 Data Products

Aurora	Night	Day
Boundary specification Effective * energy flux, Q	Total electron content	Solar EUV flux index, Q_{euv} O/N_2 ratio on disk
Effective * average energy, <E>		Temperature profile
Peak ionization rate		Neutral density profiles: O, N_2, O_2 on limb
Column ionization rate		

* Effective assumes precipitating particles are pure electrons

Data Product Sizing Estimates

Level 0 data	~ 90 MBytes/day
Level 1A data	~ 12 MBytes/orbit
Level 1C data: Disk: Limb: Spectrograph:	 ~ 20 MBytes/orbit ~ 2 MBytes/orbit ~ 2 MBytes/orbit
Level 2B data: Disk: Limb:	 ~ 4 MBytes/orbit ~ 0.75 MBytes/orbit
Overlays	~ 0.40 MBytes/orbit
Survey products:	~ 30 MBytes/day

Data Product File Structure

- Routine Level 1 & 2 data products produced on an orbit basis
- Survey/summary products produced on a daily basis
- TIMED requires all data products exchanged between Science Data System Facilities to be in NetCDF (a self documenting file format) except survey products containing images or animation
- NetCDF data file readers will be available at a minimum in Ada, C++ and IDL

Level 1A Data Products

- Virtual
- Sorted by spacecraft time for a single orbit and contains:
  - Spacecraft time
  - Raw GUVI housekeeping and telemetry at full resolution
  - Subset TIMED spacecraft housekeeping data
  - Actual spacecraft position, velocity & attitude
  - Kp, Ap and F10.7

Level 1C Data Files

- **Level 1C consists of 3 separate data product files per orbit:**
  - Disk (25 km X 25 km resolution)
    - **Proton and mixed proton/electron auroral boundaries (actual and model)**
    - **Gridded, binned, calibrated and geolocated sensor data for day, night, auroral, twilight and unknown pixels**

Level 1C Data Files - cont.

- Limb (25 km X 25 km resolution)
  - Gridded, binned, calibrated and geolocated sensor data for day, night auroral, twilight and unknown pixels
  - Altitudes for limb profile
- Spectrograph (25 km X 25 km resolution)
  - Spectrograph counts

Level 2B Data Files

- **Level 2B consists of 2 separate data product files per orbit:**
  - **Disk (100 km X 100 km resolution)**
    - Qeuv for the entire day
    - Proton and mixed proton/electron auroral boundaries (actual and model)
    - Gridded, geolocated and binned (in some cases) for day, night, auroral and mixed data
  - **Limb (100 km X 100 km resolution)**
    - Gridded and binned for day and night pixels

Dynamic Overlay Data Files

- F10.7 - daily and 81 day average
- Kp - daily and 3 hour
- ap, Ap - daily and 3 hour
- Satellite ground track coordinates
- Sunward disk scan boundary coordinates
- Anti-sunward disk scan boundary coord.
- Terminator crossing coordinates
- Local solar time
- Solar zenith angle

Supporting Data Files

- **Separate files correlated by s/c time containing:**
  - **GUVI housekeeping data**
  - **Spacecraft house keeping data**
  - **Actual position, velocity and attitude data**
  - **Tangent point position & solar conditions**
  - **Pierce point position position & solar conditions**

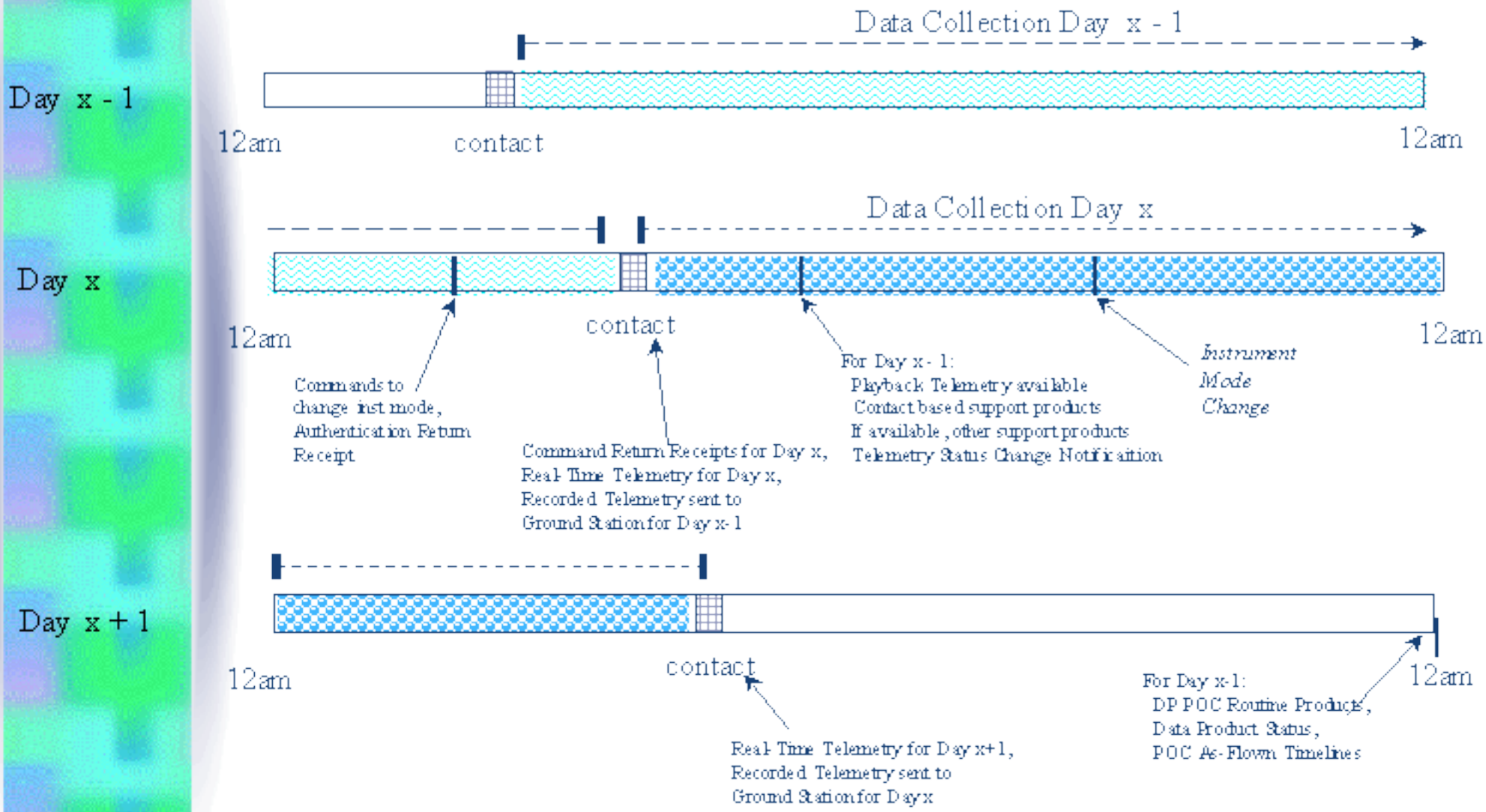
User Created Data Products

- Web based utility provided to register and store user created data products on the DP POC
- User created data products will be archived by DP POC
- No version control provided by DP POC for user data products
- If provided to the Science Data System, must be in NetCDF
- GUVI file naming conventions must be utilized
- TIMED and GUVI header requirements must be utilized

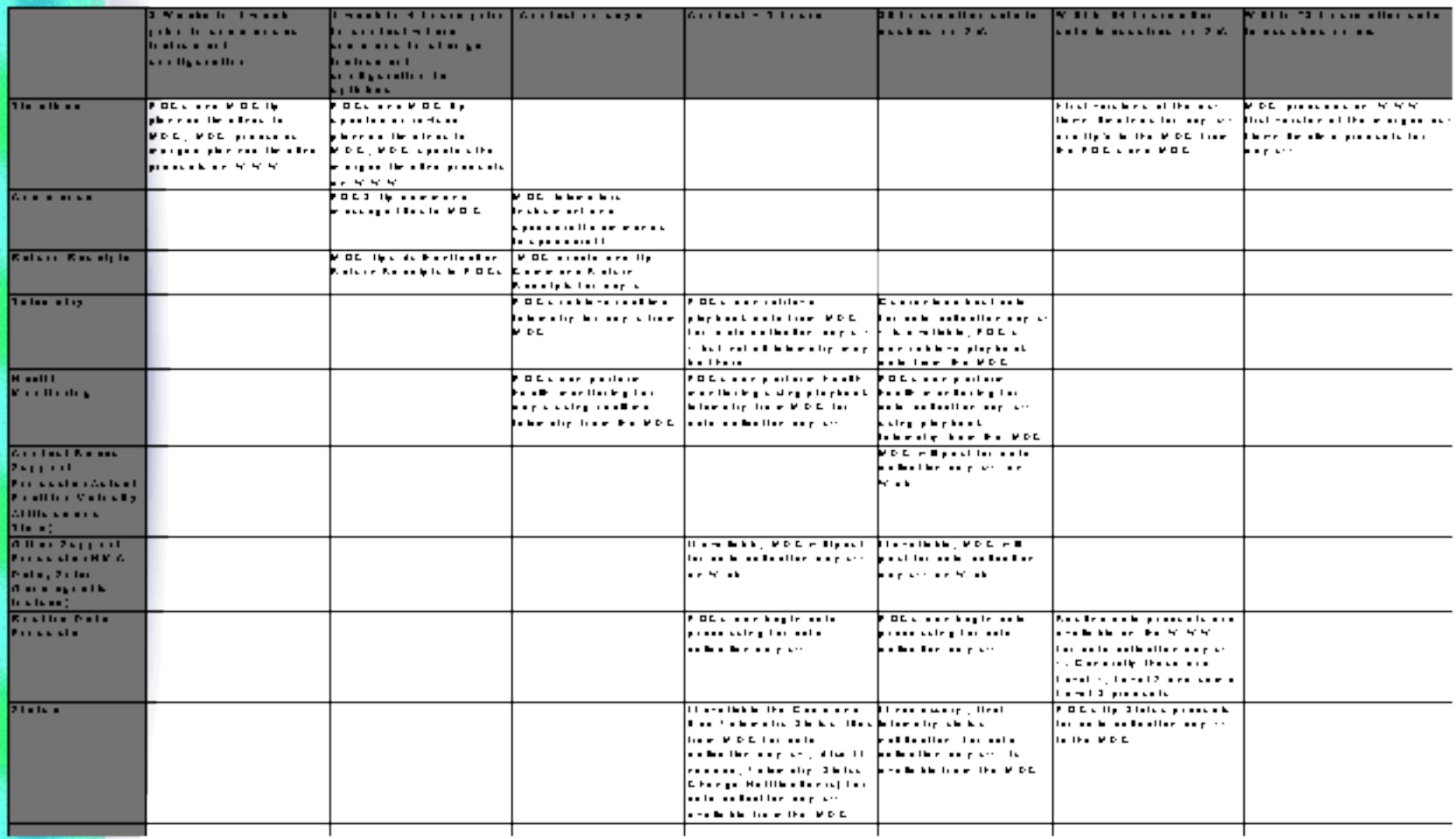
Data Product Development Schedule

Data Product	Available
Format Template	Now
Level 1A	8/98
Level 1C	2/99
Level 2B	10/99
Status	12/99
Survey	12/99

Data Processing Schedule



Nominal POC Data Processing Schedule



Data Interface and Access

- Access to routine GUVI data products:
  - Distributed to GUVI Co-Is via CD-ROM
  - Available via the Internet
- Data product interface
  - NetCDF readers available via the Internet
  - DP POC User Interface graphically displays all routine GUVI data products
  - User login required to access data products via Internet
  - Ability to categorize and/or search the GUVI data with the data catalog

TIMED Planning Tools

Used to provide operational information

- Daily coverage plots, predicted and actual
  - Color coded areas of coverage for each instrument plotted on a continental map
  - Underlying coverage data available for download
- Time plots showing planned and as flown timelines
  - Instrument by instrument or all instruments together, including S/C
  - Available given a time range
- Plans, reports and other files can be downloaded from the TIMED area

GUVI Planning Tools

- Predicted timelines
- As flown timelines
- TIMED contact schedule
- Coordination with other instruments/sites
  - TIMED/GUVI w/in LOS of site
  - Site w/in LOS of TIMED/GUVI
  - Mode of another instrument
- Polar projections of predicted auroral boundary over time