A Detailed Examination of the GPM Core Satellite Gridded Text Product

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1. Background
The Global Precipitation Measurement (GPM) mission is an international endeavor to develop a new generation of precipitation measurement instruments and algorithms for satellite remote sensing. The GPM mission includes the Integrated Multi-satellite Retrieval for GPM (IMERG) which provides the global precipitation rates for all of the GPM instruments. The primary goal of IMERG is to provide precipitation estimates for the entire globe, including the tropical areas that are still unaccounted for by current satellite precipitation products. The GPM mission is a major step towards achieving global coverage of precipitation rates.

2. Metadata Header Lines Content
The first 5 lines in the file are header lines that contain metadata, as listed below:

(1) Gridname: GMI  
(2) Gridname: Ku  
(3) Gridname: Ka  
(4) Gridname: combined (GMI+Ku+Ka)  
(5) Gridname: GPM

These gridnames are used for identifying the grid data, and they are used in the retrieval of precipitation rates.

3. General Data Line Format
There is one data line for each grid box, each hour. Each data line starts with the hour and minute of the first pixel in the grid box. The next two fields in the line provide the row and the column identifiers for the gridbox within a grid. The remaining fields provide the precipitation rates and other parameters for the grid box.

4. Data Line Content Details
Each data line has a value for each line started in line 6 of the header and described in

- Precipitation rate (mm/hr)
- Liquid fraction
- Convective fraction
- Precipitation type
- Retrieval quality
- Global coordinates
- Observation date

Users can be assured that each data line has the same number of fields on it, but users should not assume that each field contains the same value for all of the GPM instruments. The ambiguity is due to the different retrieval algorithms used for each instrument.

5. Calculation of Data Lines
All calculations are done on hourly quartile grids (25 km cells). The hourly quartile grids are maintained for each instrument and are used in all of the calculations. The calculations are done on each instrument and on the combined (GMI+Ku+Ka) retrieval quality. The calculations are performed on the grid data and the results are reported in the hourly gridded text product.

6. Obtaining the Data
The GPM gridded text product may be retrieved using FTP service of the precipitation estimation software (PPS) as described in the paper.

7. Software Tools
The software tools used in the paper include MATLAB (MathWorks) for data analysis and visualization, and Python (Python Software Foundation) for data processing and visualization.

For additional information, please contact Erich Franz Stocker at NASA/GSFC Code 621.