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A Detailed Examination of the GPM Core Satellite Gridded Text Product

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The Precipitation Processing System (PPS) is producing a gridded text product based on the L2 swath instantaneous precipitation retrievals from instruments aboard the Global Precipitation Measurement (GPM) mission. PPS produces instantaneous precipitation retrievals from the GPM Microwave Imager (GMI), the dual-frequency radar (DPR), and a combination of the two instruments (GMI/DPR). These swath-level retrievals are placed into separate HDF5 file for each orbit, which contain many additional parameters other than surface precipitation retrievals. Because there are so many additional parameters they are organized into related groups within the HDF5 file. This format can be intimidating to many users who are interested only in surface precipitation. They want just the appropriate parameters and they want them put into a file in a simple and easily accessible format.

For this reason, scientists and PPS have collaborated to develop a gridded text product that summarizes a full day of instantaneous retrievals at the swath level by gridding the pixels of the swath products into a .25 degree x .25 degree hourly grid. All 24 hourly grids are packaged into a daily ASCII file. Data in the file is written in text lines terminated by the newline character. These products read through each the orbital files from the GPROF GMI retrieval, the DPR Ku/and dual-frequency retrieval, and the combined GMI/DPR retrieval and then grid the pixel by hour and packages them into a daily file.

This paper provides the details of the core-satellite gridded product and of some tools for working with the files. It describes the calculations that were used in the gridding procedure. It provides examples of data lines. In addition, it provides examples of how the display and subsetting tool for this product can be used online and on the desktop [?? Is the browser-based online display tool that I'm working on supposed to run on the desktop too? I haven't thought about how to make it run under Windows or Mac OS X.] to view and create subsets of the product. Finally it provides information about accessing the files.

The daily gridded products are organized into metadata lines and data lines. The first five lines contain metadata about the product. Each data line contains the instrument information for the GMI GPROF retrieval, the KU radar retrieval, the Dual-frequency radar retrieval, and the combined GMI/DPR radar retrieval. Each of these instrument groups contains the following information:

1.total number of pixels in the .25 degree x .25 degree hourly grid box
2.number of precipitating pixels in the grid box
3.unconditioned mean precipitating rate in mm/hr (the unconditioned mean is the average of the rain rain for all observed pixels including pixels with a zero rain rate or an those with greater than zero rain rate)
4.percent of the population of pixels that have greater than zero rain rates that were identified as having convective type rainfall (as opposed to stratiform, warm, or other rainfall types).
5.percent of of the population of pixels that have greater than zero rain rates with liquid precipation (as opposed to solid or mixed-phase precipitation)

On the line before the instrument group data are the:

1.hour of the grid and the minute of the first pixel in the grid box
2.row and column grid-box index for a global .25 deg x .25 deg grid