

**TROPICAL RAINFALL MEASURING MISSION
PRECIPITATION PROCESSING SYSTEM**

**File Specification
3B42**

Version 7

March 23, 2012

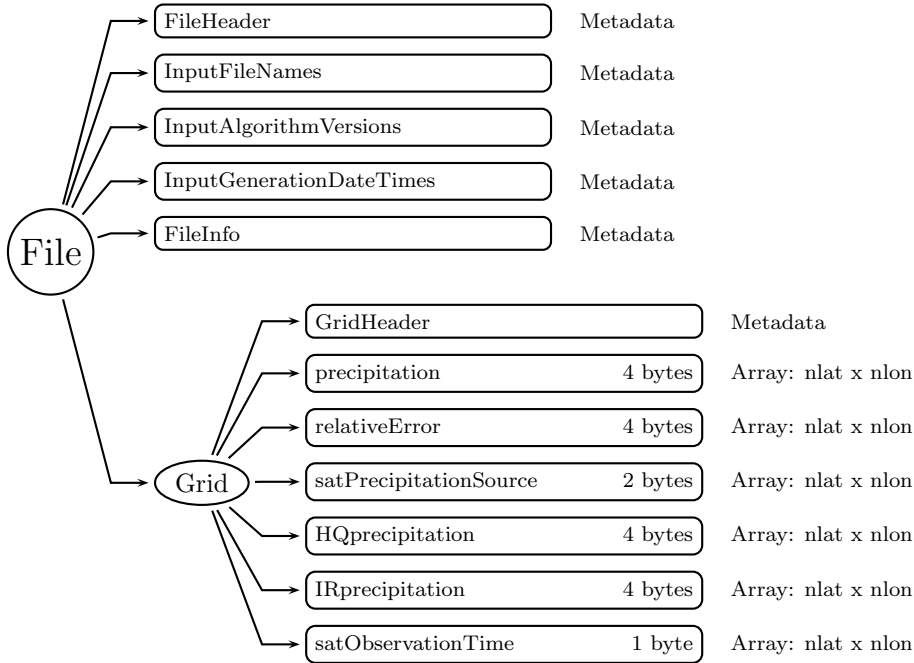


Figure 1: Data Format Structure for 3B42, TRMM and Other Sensors - 3-Hourly

0.1 3B42 - TRMM and Other Sensors - 3-Hourly

3B42, "TRMM and Other Sensors - 3-Hourly", provides precipitation estimates in the TRMM regions that have the (nearly-zero) bias of the "TRMM Combined Instrument" precipitation estimate and the dense sampling of high-quality microwave data with fill-in using microwave-calibrated infrared estimates. The granule size is 3 hours. The following sections describe the structure and contents of the format.

Dimension definitions:

nlat 400 Number of 0.25° grid intervals of latitude from 50° N to 50° S.
 nlon 1440 Number of 0.25° grid intervals of longitude from 180° W to 180° E.

Figure 1 shows the structure of this product. The text below describes the contents of objects in the structure, the C Structure Header File and the Fortran Structure Header File.

FileHeader (Metadata):

FileHeader contains general metadata. This group appears in all data products. See Metadata for TRMM Products for details.

InputFileNames (Metadata):

InputFileNames contains a list of input file names for this granule. See Metadata for TRMM Products for details.

InputAlgorithmVersions (Metadata):

InputAlgorithmVersions contains a list of input algorithm versions for this granule. See

Metadata for TRMM Products for details.

InputGenerationDateTimes (Metadata):

InputGenerationDateTimes contains a list of input generation datetimes. See Metadata for TRMM Products for details.

FileInfo (Metadata):

FileInfo contains metadata used by the PPS I/O Toolkit (TKIO). This group appears in all data products. See Metadata for TRMM Products for details.

Grid (Grid)

GridHeader (Metadata):

GridHeader contains metadata defining the grids in the grid structure. See Metadata for TRMM Products for details.

precipitation (4-byte float, array size: nlat x nlon):

This is the merged microwave/IR precipitation estimate at each $0.25^\circ \times 0.25^\circ$ box. Values range from 0 to 100 mm/hr. Special values are defined as:

-9999.9 Missing value

relativeError (4-byte float, array size: nlat x nlon):

This is the merged microwave/IR precipitation relative error estimate at each $0.25^\circ \times 0.25^\circ$ box. Values range from 0 to 100 mm/hr. Special values are defined as:

-9999.9 Missing value

satPrecipitationSource (2-byte integer, array size: nlat x nlon):

Flag to show source of data at each $0.25^\circ \times 0.25^\circ$ box. Note: "Conical scanner" includes TMI, AMSR, SSMI, and SSMI/S. Flag values are:

- 0 no observation
 - 1 AMSU
 - 2 TMI
 - 3 AMSR
 - 4 SSMI
 - 5 SSMI/S
 - 6 MHS
 - 7 TCI
 - 30 AMSU/MHS average
 - 31 Conical scanner average
 - 50 IR
- Add 100 to above if sampling is less than or equal to two pixels

HQprecipitation (4-byte float, array size: nlat x nlon):

This is the pre-gauge-adjusted microwave precipitation estimate at each $0.25^\circ \times 0.25^\circ$ box. Values range from 0 to 100 mm/hr. Special values are defined as:

-9999.9 Missing value

IRprecipitation (4-byte float, array size: nlat x nlon):

This is the pre-gauge-adjusted infrared precipitation estimate at each $0.25^\circ \times 0.25^\circ$ box. Values range from 0 to 100 mm/hr. Special values are defined as:

-9999.9 Missing value

satObservationTime (1-byte integer, array size: nlat x nlon):

The satellite observation time minus the time of the granule at each $0.25^\circ \times 0.25^\circ$ box. In case of overlapping satellite observations, the two or more observation times are equal-weighting averaged. Values range from -90 to 90 minutes. Special values are defined as:

-99 Missing value

C Structure Header file:

```
#ifndef _TK_3B42_H_
#define _TK_3B42_H_

#ifndef _L3B42_GRID_
#define _L3B42_GRID_

typedef struct {
    float precipitation[1440][400];
    float relativeError[1440][400];
    short satPrecipitationSource[1440][400];
    float HQprecipitation[1440][400];
    float IRprecipitation[1440][400];
    signed char satObservationTime[1440][400];
} L3B42_GRID;

#endif

#endif
```

Fortran Structure Header file:

```
STRUCTURE /L3B42_GRID/
    REAL*4 precipitation(400,1440)
    REAL*4 relativeError(400,1440)
    INTEGER*2 satPrecipitationSource(400,1440)
    REAL*4 HQprecipitation(400,1440)
    REAL*4 IRprecipitation(400,1440)
    BYTE satObservationTime(400,1440)
END STRUCTURE
```