TROPICAL RAINFALL MEASURING MISSION PRECIPITATION PROCESSING SYSTEM

File Specification
3A11

Version 7

March 23, 2012

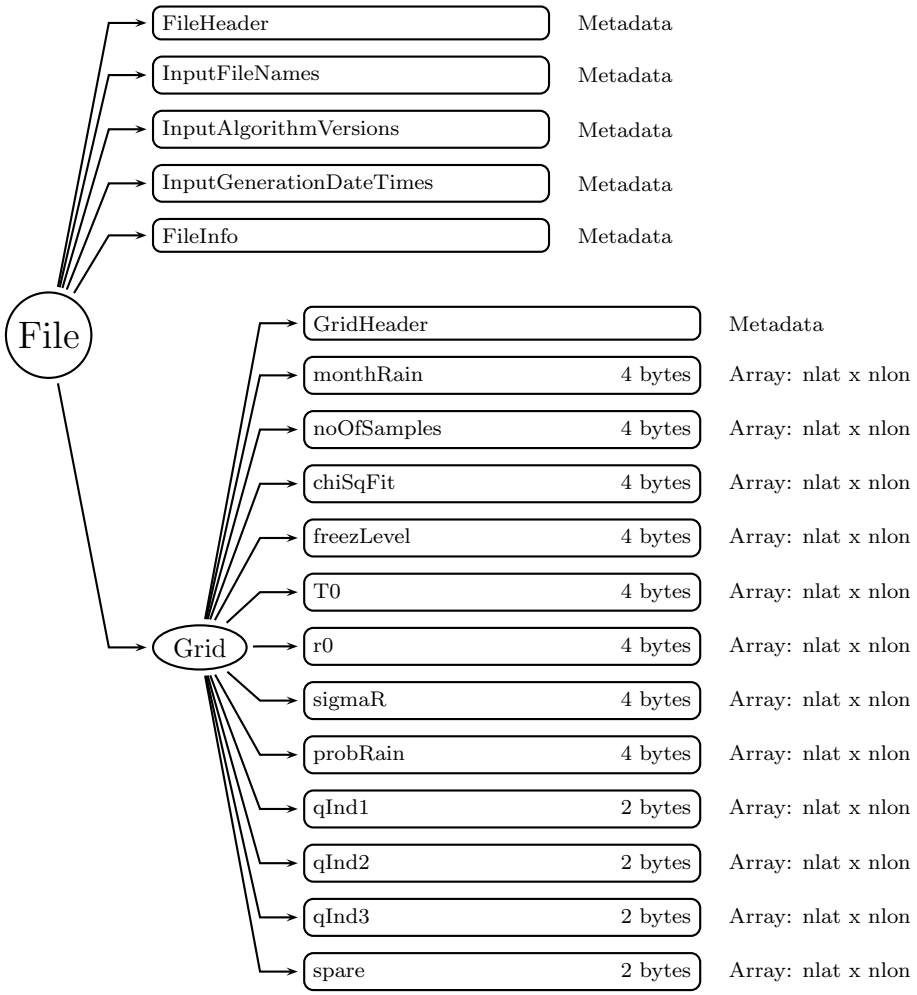

Figure 1: Data Format Structure for 3A11, TMI Emission

0.1 3A11 - TMI Emission

3A11, "TMI Emission", produces 5deg x 5deg monthly oceanic rainfall maps using TMI Level-1 data. Statistics of the monthly rainfall will also be calculated. The following sections describe the structure and contents of the format.

Dimension definitions:

nlat	16	Number of 5 degree grid intervals of latitude from 40 N to 40 S.
nlon	72	Number of 5 degree 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.

monthRain (4-byte float, array size: nlat x nlon):
The Monthly Rainfall is the surface rainfall over oceans in 5 x 5 boxes from 40N to 40S. It ranges from 0.0 to 3000.0 mm. Data on land areas are assigned the value -9999.9

noOfSamples (4-byte integer, array size: nlat x nlon):
The Number of Samples is that over oceans in 5 x 5 boxes for one month. It ranges from 0 to 500,000. Data on land areas are assigned the value -9999.

chiSqFit (4-byte integer, array size: nlat x nlon):
The Chi Square Fit indicates how well the histogram of brightness temperatures fits the lognormal distribution function in 5 x 5 boxes for one month. It ranges from 1 to 1,000,000,000. Data on land areas are assigned the value -9999.

freezLevel (4-byte float, array size: nlat x nlon):
The Freezing Level is the estimated height of 0C isotherm over oceans in 5 x 5 boxes for one month. It ranges from 0.00 to 6.00 km. Data on land areas are assigned the value -9999.9

T0 (4-byte float, array size: nlat x nlon):
The T_0 is the mean of non-raining brightness temperatures over oceans in 5 x 5 boxes for one month. It ranges from 160.0 to 180.0 K. Data on land areas are assigned the value -9999.9

r0 (4-byte float, array size: nlat x nlon):
The r_0 is the logarithmic mean rain rate over oceans in 5 x 5 boxes for one month. It ranges from 0.00 to 15.00 mm/hr. Data on land areas are assigned the value -9999.9

sigmaR (4-byte float, array size: nlat x nlon):
The Sigma_r(sigmar) is the standard deviation of logarithmic rain rates over oceans in 5 x 5 boxes for one month. It ranges from 0.00 to 1.00 mm h-1. Data on land areas are assigned the value -9999.9

probRain (4-byte float, array size: nlat x nlon):
The Probability of Rain is that over oceans in 5 x 5 boxes for one month. It ranges from 0.000 to 1.000. Data on land areas are assigned the value -9999.9

qInd1 (2-byte integer, array size: nlat x nlon):
TBD

qInd2 (2-byte integer, array size: nlat x nlon):
TBD

qInd3 (2-byte integer, array size: nlat x nlon):
TBD

spare (2-byte integer, array size: nlat x nlon):
TBD.

C Structure Header file:

```
#ifndef _TK_3A11_H_
#define _TK_3A11_H_

#ifndef _L3A11_GRID_
#define _L3A11_GRID_

typedef struct {
    float monthRain[72][16];
    int noOfSamples[72][16];
    int chiSqFit[72][16];
    float freezLevel[72][16];
    float T0[72][16];
    float r0[72][16];
    float sigmaR[72][16];
    float probRain[72][16];
    short qInd1[72][16];
    short qInd2[72][16];
    short qInd3[72][16];
    short spare[72][16];
} L3A11_GRID;

#endif

#endif
```

Fortran Structure Header file:

```
STRUCTURE /L3A11_GRID/
    REAL*4 monthRain(16,72)
    INTEGER*4 noOfSamples(16,72)
    INTEGER*4 chiSqFit(16,72)
    REAL*4 freezLevel(16,72)
    REAL*4 T0(16,72)
    REAL*4 r0(16,72)
    REAL*4 sigmaR(16,72)
    REAL*4 probRain(16,72)
    INTEGER*2 qInd1(16,72)
    INTEGER*2 qInd2(16,72)
    INTEGER*2 qInd3(16,72)
    INTEGER*2 spare(16,72)
END STRUCTURE
```