

The Tropical Rainfall Measuring Mission (TRMM) is a joint U.S.-Japan satellite mission to monitor tropical and subtropical precipitation and to estimate its associated latent heating. TRMM was successfully launched on November 27, at 4:27 PM (EST) from the Tanegashima Space Center in Japan.

The rainfall measuring instruments on the TRMM satellite include the Precipitation Radar (PR), an electronically scanning radar operating at 13.8 GHz; TRMM Microwave Image (TMI), a nine-channel passive microwave radiometer; and Visible and Infrared Scanner (VIRS), a five-channel visible/infrared radiometer.

The purpose of the 3B42 algorithm is to produce TRMM-adjusted merged-infrared (IR) precipitation and root-mean-square (RMS) precipitation-error estimates. The algorithm consists of two separate steps. The first step uses the TRMM VIRS and TMI orbit data (TRMM products 1B01 and 2A12) and the monthly TMI/TRMM Combined Instrument (TCI) calibration parameters (from TRMM product 3B31) to produce monthly IR calibration parameters. The second step uses these derived monthly IR calibration parameters to adjust the merged-IR precipitation data, which consists of GMS, GOES-E, GOES-W, Meteosat-7, Meteosat-5, and NOAA-12 data. The final gridded, adjusted merged-IR precipitation (mm/hr) and RMS precipitation-error estimates have a 3-hourly temporal resolution and a 0.25-degree by 0.25-degree spatial resolution. Spatial coverage extends from 50 degrees south to 50 degrees north latitude.

The daily accumulated (beginning at 00Z and ending at 21Z; unit: mm) rainfall product is derived from this 3-hourly product. The data are stored in flat binary.

The file size is about 2.25 MB (uncompressed).

The following read program in Fortran:

```
      real*4 data(1440,400),datain(1440,400)
      real lon
      real lat
      CHARACTER*1      cvarin (4), cvar (4)
C
      EQUIVALENCE (cvarin, varin)
      EQUIVALENCE (cvar, var)
C
C
      open(10,file='3B42_daily.2009.05.31.6.bin',
+         access='DIRECT',status='OLD',recl=1440*400*4)
C
      read(10,rec=1)datain
C
C      This part is for Little Endian machine
C      (The data was written in Big Endian).
C      Now that the data has been read into the array, swap
C      the byte order.
C
      DO i = 1, 1440
        DO j = 1, 400
          varin = datain (i, j)
          cvar (1) = cvarin (4)
          cvar (2) = cvarin (3)
          cvar (3) = cvarin (2)
          cvar (4) = cvarin (1)
          data (i, j) = var
```

```

        END DO
    END DO
c
c
c
    do 15 jj=1,400
    do 15 ii=1,1440
    if (ii <= 720) then
    lon = 0.125 + 0.25*(ii-1)
    else
    lon = 0.125 + 0.25*(ii-1) - 360.0
    endif
    lat = -49.875+0.25*(jj-1)
    write(*,*)lon,lat,data(ii,jj)
15    continue
c
    close(10)
c
    end

```

#### A sample program in Matlab

% This program is to read a TRMM 3B42 daily binary file

```

fid = fopen('3B42_daily.2009.05.31.6.bin', 'r');
a = fread(fid, 'float','b');
fclose(fid)

data = a';

count = 1;
for i_lat = 1:400
    for j_lon = 1:1440
        lat = -49.875 + 0.25*(i_lat - 1)
        if j_lon <= 720
            lon = 0.125 + 0.25*(j_lon - 1)
        else
            lon = 0.125 + 0.25*(j_lon - 1) - 360.0
        end
        daily_rain_total = data(count)
        count = count + 1;
    end
end
end

```

Questions and help: [gsfc-help-disc@lists.nasa.gov](mailto:gsfc-help-disc@lists.nasa.gov)