GCOM-C radiance global binning algorithm

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1. Background

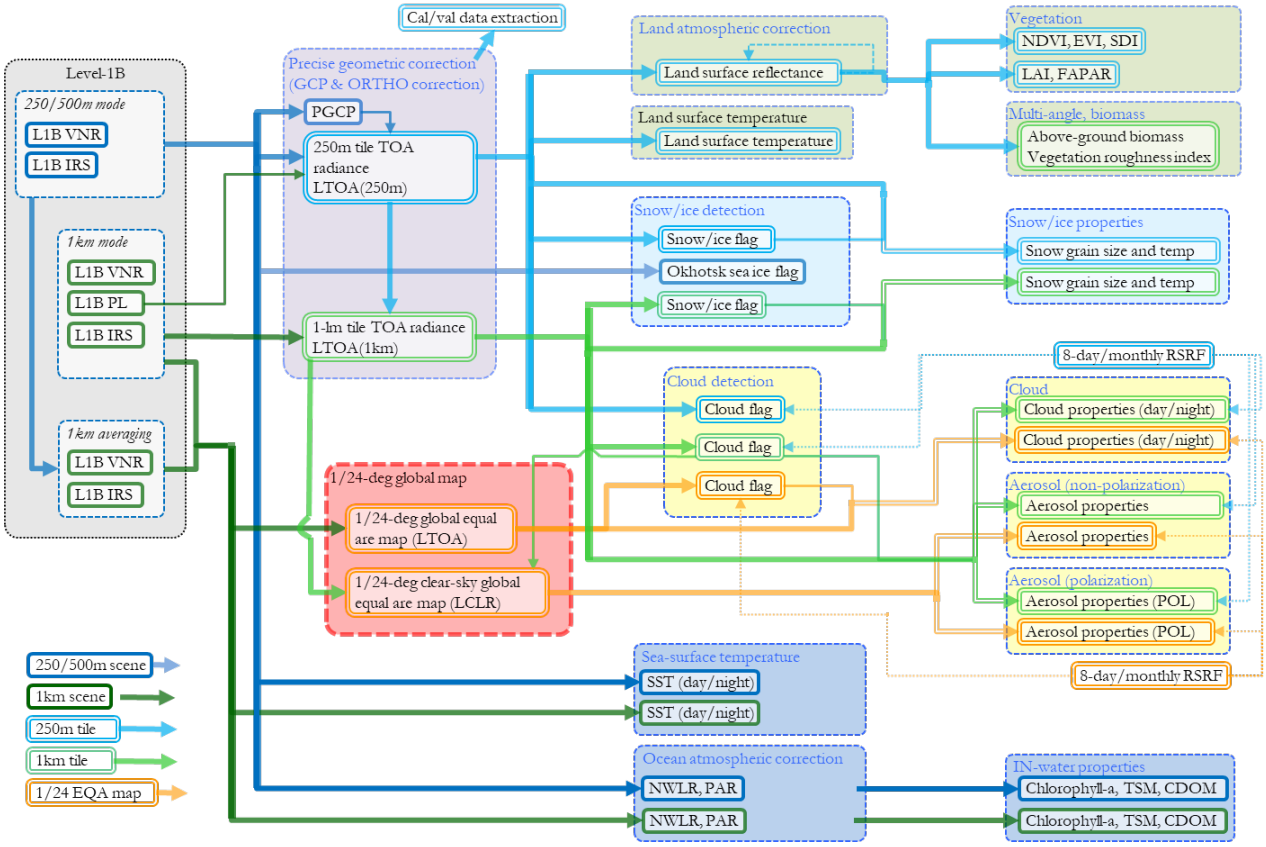

Figure 1 GCOM-C processing flow from Level-1B to Level-2

GCOM-C asmosphere algorithms read global mapped radiance datasets for overvewing global distribution of the cloud and aerosols. Two GCOM-C global binning datasets are produced (red colored parts in Fig. 1):

(1) one is an simple resampling data for the cloud algorithms,

(2) the other is non-cloud-pixel sampling data for aerosol algorithms.

2. Method

2.1. Simple resampling (LTOAF)

L1B data is resampled to the global equal-area (sinusoidal) grids (EQA). The EQA grid is defined as follows as same as IOCCG Report Number 4, 2004.

Line size (NL) and pixel size (NP_0) when resolution d=0.04 degrees are calculated as follows.

NL=NINT(180/d), from S-pole to N-pole

$NP_0 = 2 \times NINT[180/d]$, *from 180W to 180E*

Latitude (lat) and Longitude (lon) can be calculaed from line number (lin) and colomn number (col).

$lat = 90 - (lin - 0.5) \times d$,

$lon = 360/NP_i \times (col - NP_0/2 - 0.5)$,

where, $NP_i = NINT[NP_0 \times cos(lat)]$.

The lin and col can be converted from lat and lon as follows.

$lin = NINT[(90 - lat)/d + 0.5]$

$col = NINT[NP_0/2 + NP_i \times lon/360 + 0.5]$

where, $NP_i = NINT[NP_0 \times sin((lin - 0.5) \times d)$.

A nearest L1B (VNR-NP, PL, and IRS) pixel from the center location of the each EQA grid is selected by using L1B geolocation (/Geometry_data/Latitude and /Geometry_data/Longitude) datasets. Ascending and descending data is binned to separate files (indicated by “yyyymmdd”D01D and “yyyymmdd”A01D in the output filename). The binning time range is basically one day (from 00:00UT to 23:59UT).

2.2. Non-cloud pixel resampling (LCLRF)

GCOM-C 1-km tile mosaic data (LTOAK and LTOAL) is resapled to the global EQA. A LTOA pixel which is discrminated as clear (probability flag “110”) by the 1-km cloud flag data (/Image_data/Cloud_flag in CLFGK) and nearest from the center of the EQA grid within the EQA grid area is selected.

3. Output file name

(1) LTOAF

GC1SG1”yyyymmdd”D01D_A0000_L2SG_LTOAF_”vvvv”.h5 (Descending: daytime)

GC1SG1”yyyymmdd”A01D_ A0000_L2SG_LTOAF_”vvvv”.h5 (Ascending: nighttime)

yyyy: year

mm: month

dd: day

vvvv: product version

(2) LCLRF

GC1SG1”yyyymmdd”D01D_A0000_L2SG_LCLRF_”vvvv”.h5 (Descending: daytime)

GC1SG1”yyyymmdd”A01D_ A0000_L2SG_LCLRF_”vvvv”.h5 (Ascending: nighttime)

References

IOCCG Report 4, “Guide to the creation and use of ocean-colour, Level-3, binned data products,” Edited by David Antoine, pp. 88 (2004).