On the ACOS Orbit, Archive, and File Names

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1 Introduction

This memo describes three aspects of how ACOS data are archived and the Level 2 files are named. Section 2 describes the ACOS groups and Path Calendars. Section 3 describes how the files are organized in the GES-DISC archive. Section 4 describes aspects of the ACOS file names.

2 GOSAT Path Calendar

The ACOS data products are derived from observations obtained by the IBUKI GOSAT satellite. The GOSAT orbital parameters are described in the ACOS README file[1]. Since the satellite has a 3 day repeat cycle with $14\frac{2}{3}$ rev/day, each day has 14 or 15 orbits and there are 44 different possible orbit paths. The orbit paths are numbered 1-44 with orbit 1 starting at the ascending node at Longitude $\sim 4.92°$ west. Each subsequent orbit path is shifted by $\sim 8.18°$ west of the previously numbered in longitude at the equator.

The GOSAT Path Calendar[2] groups orbits into 3 groups (A, B, and C) which are defined below:

Group A: Paths 1, 4, 7, 10, 13, 16, 19, 22, 25, 28, 31, 34, 37, 40,

Group B: Paths 43, 2, 5, 8, 11, 14, 17, 20, 23, 26, 29, 32, 35, 38, 41

Group C: Paths 44, 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42

The date for each orbit published in the GOSAT path calendar is defined at the longitude of the ascending node.

[1] ftp://aurapar1u.ecs.nasa.gov /data/s4pa/GOSAT_TANSO_Level2/ACOS_L2S.2.9/doc/README.ACOS_L2S_v2.9.pdf

[2] See, http://www.gosat.nies.go.jp/eng/technology/technology.htm.

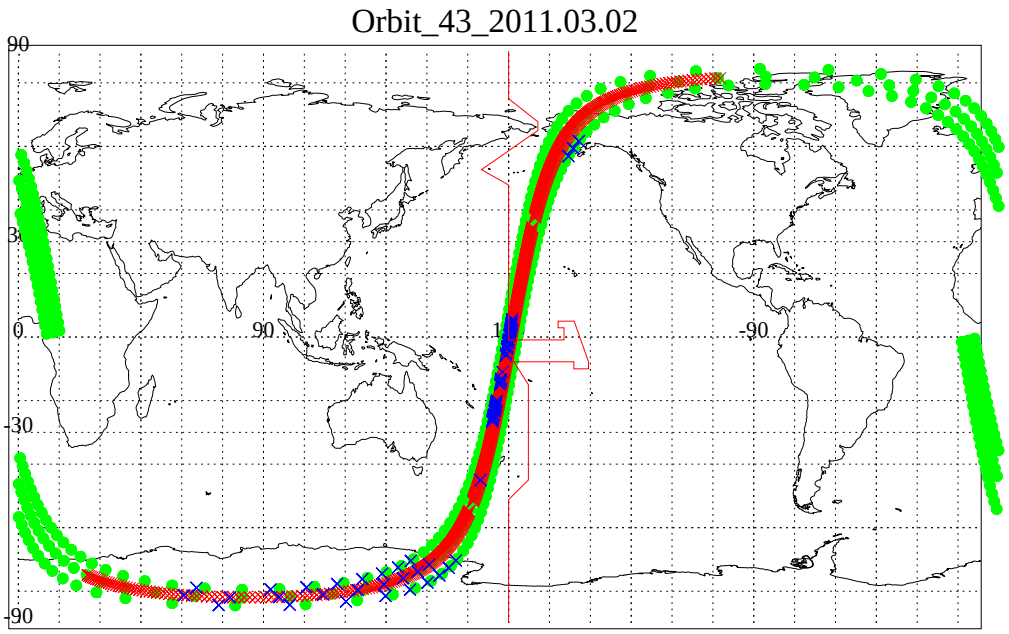

Figure 1: This figure shows the "mesh3" points (green), L1b locations (red), and Level 2 locations (blue) for orbit 43 on March 2nd, 2011 (A group B day).

3 The GES-DISC Archive

The GES-DISC organizes the orbits by the metadata given in the variables *RangeBeginningDate* and *RangeBeginningTime* in UTC which are the date and times for any given orbit at which the spacecraft began to collect science data that can be used for the ACOS retrieval. Since the ACOS retrieval is dependent upon reflected solar radiation the range beginning date is always on the descending part or the orbit.

The ACOS Level 1b or Level 2 files do not provide the longitude and latitude for the ascending parts of the orbit. However, the GOSAT web page provides GOSAT Standard Mesh Point "SMP" files that give the approximate longitude and latitude of the observations for each orbit number and scan pattern. These files are available from the same web page as the Path Calendar files.

For some observations the orbit may start on one date and begin acquiring data on another. For example, orbit 43 (see, Figure 1) actually starts on March 1 Universal Time (A group A day) but begins acquiring science data for the ACOS retrieval on March 2nd (A group B day). Therefore this orbit file is associated with Group B on March 2nd, 2011.

4 ACOS File Names

Another feature of the ACOS file naming convention is that the string indicating the observation date in the ACOS file name does not always correspond to the date of the observations

because the date in the file name is predicted by an algorithm that is independent of the actual data acquisition times. Table 1 lists the following metadata fields for the ACOS orbits from March 1-3, 2011: *AscendingNodeCrossingDate*, *AscendingNodeCrossingTime*, *RangeStartDate*, *RangeStartTime*, *RangeEndDate* and *RangeEndTime*. The file name for orbit 42 on March 3rd is

acos_L2s_110304_42_Production_v110110_L2s20900_r01_PolB_111010065643.h5

and contains the observation date string 110304 indicating the date in YYMMDD format. Table 1 shows that the the ascending node and *RangeStartDate* were on March 3rd 2011 but the *RangeEndDate* was on March 4th. However, the *RangeEndDate* does not always define the date string in the file name because orbit 41 on March 2nd 2011 ended on March 3rd but its file name

acos_L2s_110302_41_Production_v110110_L2s20900_r01_PolB_111010052517.h5

still contains the string "110302." Users should rely on the metadata in the files rather than the date string in the file names for determining the date of the observations.

Table 1: ACOS metadata

Orbit Number	AscendingNodeCrossingDate and Time	RangeBeginningDate and Time	RangeEndingDate and Time
		2011.03.01	
1	2011-03-01:01:01:58.420Z	2011-03-01:01:27:14.357Z	2011-03-01:02:20:05.634Z
4	2011-03-01:02:40:09.306Z	2011-03-01:03:05:25.198Z	2011-03-01:03:57:16.583Z
7	2011-03-01:04:18:20.191Z	2011-03-01:04:43:36.079Z	2011-03-01:05:35:32.077Z
10	2011-03-01:05:56:31.118Z	2011-03-01:06:21:47.002Z	2011-03-01:07:13:43.036Z
13	2011-03-01:07:34:42.152Z	2011-03-01:07:59:58.046Z	2011-03-01:08:51:49.554Z
16	2011-03-01:09:12:53.175Z	2011-03-01:09:38:09.132Z	2011-03-01:10:30:00.595Z
19	2011-03-01:10:51:04.140Z	2011-03-01:11:16:20.105Z	2011-03-01:12:08:11.513Z
22	2011-03-01:12:29:15.056Z	2011-03-01:12:54:30.995Z	2011-03-01:13:46:22.375Z
25	2011-03-01:14:07:25.937Z	2011-03-01:14:32:41.848Z	2011-03-01:15:24:33.218Z
28	2011-03-01:15:45:36.819Z	2011-03-01:16:10:52.707Z	2011-03-01:17:02:44.092Z
31	2011-03-01:17:23:47.754Z	2011-03-01:17:49:03.634Z	2011-03-01:18:41:50.383Z
34	2011-03-01:19:01:58.771Z	2011-03-01:19:27:14.671Z	2011-03-01:20:19:06.162Z
37	2011-03-01:20:40:09.799Z	2011-03-01:21:05:25.746Z	2011-03-01:21:57:17.220Z
40	2011-03-01:22:18:20.802Z	2011-03-01:22:43:36.764Z	2011-03-01:23:35:23.597Z
		2011.03.02	
43	2011-03-01:23:56:31.726Z	2011-03-02:00:21:47.685Z	2011-03-02:01:13:39.061Z
2	2011-03-02:01:34:42.596Z	2011-03-02:01:59:58.516Z	2011-03-02:02:51:45.259Z
5	2011-03-02:03:12:53.469Z	2011-03-02:03:38:09.353Z	2011-03-02:04:29:56.123Z
8	2011-03-02:04:51:04.359Z	2011-03-02:05:16:20.239Z	2011-03-02:06:08:07.026Z
11	2011-03-02:06:29:15.315Z	2011-03-02:06:54:31.197Z	2011-03-02:07:46:18.038Z
14	2011-03-02:08:07:26.357Z	2011-03-02:08:32:42.267Z	2011-03-02:09:24:29.163Z
17	2011-03-02:09:45:37.347Z	2011-03-02:10:10:53.315Z	2011-03-02:11:02:40.135Z
20	2011-03-02:11:23:48.272Z	2011-03-02:11:49:04.226Z	2011-03-02:12:40:50.997Z
23	2011-03-02:13:01:59.174Z	2011-03-02:13:27:15.091Z	2011-03-02:14:19:01.864Z
26	2011-03-02:14:40:10.045Z	2011-03-02:15:05:25.947Z	2011-03-02:15:57:12.704Z
29	2011-03-02:16:18:20.934Z	2011-03-02:16:43:36.816Z	2011-03-02:17:36:00.477Z
32	2011-03-02:17:56:31.889Z	2011-03-02:18:21:47.771Z	2011-03-02:19:13:30.003Z
35	2011-03-02:19:34:42.919Z	2011-03-02:19:59:58.829Z	2011-03-02:20:51:41.106Z
38	2011-03-02:21:12:53.941Z	2011-03-02:21:38:09.898Z	2011-03-02:22:29:52.142Z
41	2011-03-02:22:51:04.918Z	2011-03-02:23:16:20.882Z	2011-03-03:00:08:03.082Z
		2011.03.03	
44	2011-03-03:00:29:15.816Z	2011-03-03:00:54:31.764Z	2011-03-03:01:46:13.906Z
3	2011-03-03:02:07:26.693Z	2011-03-03:02:32:42.596Z	2011-03-03:03:24:24.746Z
6	2011-03-03:03:45:37.567Z	2011-03-03:04:10:53.453Z	2011-03-03:05:02:35.614Z
9	2011-03-03:05:23:48.471Z	2011-03-03:05:49:04.351Z	2011-03-03:06:40:46.540Z
12	2011-03-03:07:01:59.466Z	2011-03-03:07:27:15.351Z	2011-03-03:08:18:57.612Z
15	2011-03-03:08:40:10.495Z	2011-03-03:09:05:26.428Z	2011-03-03:09:57:08.692Z
18	2011-03-03:10:18:21.468Z	2011-03-03:10:43:37.433Z	2011-03-03:11:35:19.628Z
21	2011-03-03:11:56:32.384Z	2011-03-03:12:21:48.328Z	2011-03-03:13:13:25.879Z
24	2011-03-03:13:34:43.275Z	2011-03-03:13:59:59.186Z	2011-03-03:14:51:36.734Z
27	2011-03-03:15:12:54.152Z	2011-03-03:15:38:10.046Z	2011-03-03:16:29:47.594Z
30	2011-03-03:16:51:05.062Z	2011-03-03:17:16:20.942Z	2011-03-03:18:07:44.699Z
33	2011-03-03:18:29:16.052Z	2011-03-03:18:54:31.941Z	2011-03-03:19:46:09.587Z
36	2011-03-03:20:07:27.089Z	2011-03-03:20:32:43.019Z	2011-03-03:21:24:20.682Z
39	2011-03-03:21:45:38.105Z	2011-03-03:22:10:54.070Z	2011-03-03:23:02:31.693Z
42	2011-03-03:23:23:49.051Z	2011-03-03:23:49:00.405Z	2011-03-04:00:40:42.577Z