

\*\*\*\*\* AGILE Public Data Release Note v6.0 \*\*\*\*\*

User's README  
AGILE Data Center (ADC), November 9, 2011

The proprietary period for 19 AGILE Cycle-3 Observation Blocks (OBs), from OB 8600 to OB 10400 (from 2009-11-30 to 2010-10-15), has currently expired, and the data are now public and available from the ASDC Multimission Archive webpage <http://www.asdc.asi.it/mmia/> for the AGILE Mission.

AGILE Cycle-3 data were obtained with AGILE observing a large portion of the sky in spinning mode, and they have been processed with the latest available software and calibrations optimized for the new observing mode. Delivered Cycle-3 spinning data (file type: STD1) were processed with the OB pipeline software version 5\_21\_18\_19.

The new public AGILE archive now contains both Cycle-3 spinning, and Cycle-1 and Cycle-2 pointing data.

POINTING: OB 4900 - 8400  
During the previous Cycle-1 and Cycle-2 AGILE was operated in "pointing observing mode", characterized by long observations called Observation Blocks, typically of 2-4 weeks duration, following a predefined Baseline Pointing Plan. The public archive for Cycle-1 and Cycle-2 OBs remains unchanged with respect to AGILE Public Data Release v5.0, and Cycle-1 and Cycle-2 pointing data are those reprocessed with the OB pipeline software version 5\_19\_18\_17.

SPINNING: SPINNING: OB >= 8600  
On November 4, 2009, toward the end of Cycle2, AGILE scientific operations were reconfigured following a malfunction of the rotation wheel occurred in mid October, 2009. The satellite is currently operating in a spinning observing mode, i.e. with the solar panels pointing at the Sun and the instrument axis sweeping the sky with an angular speed of ~ 0.8 degree/sec. The instrument and all the detectors are operating nominally producing data with quality equivalent to that obtained when operating in pointing mode.

IMPORTANT: To avoid spurious artefacts, the spinning dataset (file type: STD1) must be analysed in a similar way to the "non-cleaned" pointing data (file type: STD0P) according to the following recommendations on parameter values when generating maps:

fovrad=50    albrad=90    phasecode=2

See explanation for the new file naming convention in the Data Retrieval section below.

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\*\*\*\*\* Delivered Data \*\*\*\*\*  
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The AGILE observing mode was "spinning" for all Cycle-3 OBs. AGILE Cycle-3 spinning observations were structured as a series of 22 OBs with a "dummy" pointing direction, each corresponding to a unique identifying number and lasting ~15 days, except for the first four OBs (OB 8600 - OB 8900) of variable duration. The set of GRID data which become public today corresponds to the first 19 Cycle-3 observations. The last three Cycle-3 OB (10500, 10600, 10700), will be released at the end of their proprietary period on December 16, 2011.

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Delivered Cycle-3 OBs are listed below:

#	OB #	OB Name	RA_PNT	DEC_PNT	RA_SUN	DEC_SUN	OB start date	OB end date	Mean OB Exp.	Notes
1	8600	Dummy 1_1	-	-	259	-20.33	2009-11-30 12:00:00	2009-12-20 12:00:00	14782732	spinning
2	8700	Dummy 1_2	-	-	283.8	-21.31	2009-12-20 12:00:00	2010-01-15 12:00:00	17876769	spinning
3	8800	Dummy 1_3	-	-	309.2	-16.14	2010-01-15 12:00:00	2010-02-05 12:00:00	13806594	spinning
4	8900	Dummy 1_4	-	-	341.6	-4.574	2010-02-05 12:00:00	2010-02-28 12:00:00	15618616	spinning
5	9000	Dummy 2_1	-	-	348.2	-1.802	2010-02-28 12:00:00	2010-03-15 12:00:00	11062229	spinning
6	9100	Dummy 2_2	-	-	2	3.405	2010-03-15 12:00:00	2010-03-31 12:00:00	12567574	spinning
7	9200	Dummy 2_3	-	-	15.43	9.475	2010-03-31 12:00:00	2010-04-15 12:00:00	10529106	spinning
8	9300	Dummy 2_4	-	-	29.92	15.6	2010-04-15 12:00:00	2010-04-30 12:00:00	9780278	spinning
9	9400	Dummy 3_1	-	-	43.56	19.48	2010-04-30 12:00:00	2010-05-15 12:00:00	12120621	spinning
10	9500	Dummy 3_2	-	-	57.83	23.39	2010-05-15 12:00:00	2010-05-30 12:00:00	11419530	spinning
11	9600	Dummy 3_3	-	-	73.48	25.76	2010-05-30 12:00:00	2010-06-15 12:00:00	11518075	spinning
12	9700	Dummy 3_4	-	-	90.15	26.25	2010-06-15 12:00:00	2010-06-30 12:00:00	11668613	spinning
13	9800	Dummy 4_1	-	-	114.1	25.71	2010-06-30 12:00:00	2010-07-15 12:00:00	12309031	spinning
14	9900	Dummy 4_2	-	-	121.3	22.98	2010-07-15 12:00:00	2010-07-31 12:00:00	12991280	spinning
15	10000	Dummy 4_3	-	-	136.4	19.02	2010-07-31 12:00:00	2010-08-15 12:00:00	12198474	spinning
16	10100	Dummy 4_4	-	-	151.4	14.38	2010-08-15 12:00:00	2010-08-31 12:00:00	13453435	spinning
17	10200	Dummy 5_1	-	-	165.9	8.307	2010-08-31 12:00:00	2010-09-15 12:00:00	12249951	spinning
18	10300	Dummy 5_2	-	-	180	2.478	2010-09-15 12:00:00	2010-09-30 12:00:00	12251493	spinning
19	10400	Dummy 5_3	-	-	193.9	-1.843	2010-09-30 12:00:00	2010-10-15 12:00:00	12457466	spinning

The celestial coordinates of the mean pointing direction (RA\_PNT, DEC\_PNT) are not valorized in spinning mode. We provide instead the mean Sun position (RA\_SUN, DEC\_SUN), determining the forbidden region during each OB due to solar panel constraints (~ 60 degrees around the Sun and anti-Sun positions). Note that the allowed instantaneous pointing directions lie on a great circle orthogonal to the Sun direction, whose orientation changes with time, so that the whole sky is accessible during a six months period.

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***** Data Retrieval *****
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The query for the AGILE Mission data in the ASDC Multi Mission Interactive Archive <http://www.asdc.asi.it/mmia/> produces an interactive table showing OBs selected according to the chosen "Search Type" option:

- search by coordinates: the provided source position lies outside the forbidden regions around the sun/anti-sun positions
- search by time: the observation lies in the specified time-range
- search by parameter: the observation has the selected parameters (OB number values)

A query with "Search Type" by "Time", with default Start Date and End Date values results in a complete table of all public AGILE OB available to date.

The Mean OB Exposure column (in cm<sup>2</sup> s) in the interactive table corresponds to the effective area associated to the FM filtered events.

The "Public access" link makes it possible to download the following files for each OB:

\*\*\* SPINNING data files \*\*\*

- the spacecraft auxiliary (LOG) files (ag-<TSTART>\_STD1.LOG.gz) needed for the data analysis and covering approximately one-day of observation within each OB, are grouped under the directory STD1\_LOG:

```
* STD1_LOG
  ag-<TSTART1>_STD1.LOG.gz
  ag-<TSTART2>_STD1.LOG.gz
  .....
  ag-<TSTARTn>_STD1.LOG.gz
```

and a single general LOG index file with suffix: ag-STD1\_LOG-<TSTART1>.index

WARNING: LOG files have a very accurate time resolution of 100 msec and need several GB of available disk space.

- two event files including all gamma-ray events in the GRID Field of View (FoV) using two AGILE event filters:

```
  the standard OB event file ag<TSTART>-<TSTOP>_STD1_FM.EVT and its index file with suffix: .index
  the additional OB event file ag<TSTART>-<TSTOP>_ST1_FT3AB.EVT and its index file with suffix: .index
```

WARNING: data analysis with event files obtained with FT3AB filter may be more efficient in detecting sources with a soft energy spectrum, but there may be noisy residual artifacts at the border of the Field of View (off-axis angle > 40 deg).

- three Aitoff maps, count, exposure and diffuse background, centered on the Galactic Center:

```
ag<TSTART>-<TSTOP>_STD1_FM.COUNTS
ag<TSTART>-<TSTOP>_STD1_FM.EXP
ag<TSTART>-<TSTOP>_STD1_FM.GAS
```

These maps were automatically generated with the FM filter with the following parameters:

```
mdim=360.0      index=-2.1      roll_tol=360.0
mres=0.3        fovrad=50      earth_tol=5.0
lonpole=180     fovradmin=0.0   keepmono=NO
emin=100        albrad=90      phasecode=2
emax=50000     y_tol=0.5       projection=AIT
timestep=160    build=0        step=3
```

To produce your own maps and run likelihood tasks please download and install the public AGILE software available at:  
<http://agile.asdc.asi.it/public/>  
 and follow the User Manual included.

- a GIF file showing the images of both the OB (FM) exposure and count maps. For illustrative purpose only, the count map image includes automatic candidate detections in the FoV obtained with XIMAGE software.

\*\*\* POINTING cleaned data files \*\*\*

- the spacecraft cleaned auxiliary (LOG) files (ag-<TSTART>\_STD0P\_GO.LOG.gz) needed for the data analysis and covering approximately one-day of observation within each OB, are grouped under the directory STD0P\_GO\_LOG:

```
* STD0P_GO_LOG
  ag-<TSTART1>_STD0P_GO.LOG.gz
  ag-<TSTART2>_STD0P_GO.LOG.gz
  .....
  ag-<TSTARTn>_STD0P_GO.LOG.gz
```

and a single general LOG index file with suffix: ag-STD0P\_GO\_LOG-<TSTART1>.index

WARNING: LOG files have a very accurate time resolution of 100 msec and need several GB of available disk space.

- two cleaned event files including all gamma-ray events in the GRID Field of View (FoV) using AGILE event filters:

the standard OB event file ag<TSTART>-<TSTOP>\_STD0P\_GO\_FM.EVT and its index file with suffix: .index  
 the additional OB event file ag<TSTART>-<TSTOP>\_STD0P\_GO\_FT3AB.EVT and its index file with suffix: .index

WARNING: data analysis with event files obtained with FT3AB filter may be more efficient in detecting sources with a soft energy spectrum, but there may be noisy residual artifacts at the border of the Field of View (off-axis angle > 40 deg).

- three maps, count, exposure and diffuse background, centered on the mean OB pointing position:  
 ag<TSTART>-<TSTOP>\_STD0P\_GO\_FM.COUNTS  
 ag<TSTART>-<TSTOP>\_STD0P\_GO\_FM.EXP  
 ag<TSTART>-<TSTOP>\_STD0P\_GO\_FM.GAS

These maps were automatically generated with the FM filter with the following parameters:

```
mdim=120.0      index=-2.1      earth_tol=3.0
mres=0.25       fovrad=70       keepmono=NO
lonpole=180     albrad=80        phasecode=18
emin=100        y_tol=0.5       projection=ARC
emax=50000     roll_tol=360.0     step=4
```

To produce your own maps and run likelihood tasks please download and install the public AGILE software available at:  
<http://agile.asdc.asi.it/public/>  
 and follow the Software User Manual included.

- a GIF file showing the images of both the OB (FM) exposure and count maps.  
 For illustrative purpose only, the count map image includes automatic candidate detections in the FoV obtained with XIMAGE software.

\*\*\* POINTING non-cleaned data files \*\*\*

- the spacecraft auxiliary (LOG) files (ag-<TSTART>\_STD0P.LOG.gz) needed for the data analysis and covering approximately one-day of observation within each OB, are grouped under the directory STD0P\_LOG:

```
* STD0P_LOG
  ag-<TSTART1>_STD0P.LOG.gz
  ag-<TSTART2>_STD0P.LOG.gz
  .....
  .....
  ag-<TSTARTn>_STD0P.LOG.gz
```

and a single general LOG index file with suffix: ag-STD0P\_LOG-<TSTART1>.index

- two event files including all gamma-ray events in the GRID Field of View (FoV) using AGILE event filters:

the standard OB event file ag<TSTART>-<TSTOP>\_STD0P\_FM.EVT and its index file with suffix: .index  
 the additional OB event file ag<TSTART>-<TSTOP>\_STD0P\_FT3AB.EVT and its index file with suffix: .index

NOTE: if you choose to download data files with the default option "Automatically unpack the data using a Java applet" then each file name in the corresponding .index file must be changed removing the .gz suffix before running map generator tasks.

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**** On-line Analysis Interactive Tool ****
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A new beta version of the ASDC interactive tool allows Web users to preview the AGILE public data fields and to perform an interactive preliminary analysis around a chosen sky position. The tool is in a verification phase. Please send your feedback at the AGILE helpdesk.

WARNING: use only as a preview of the AGILE gamma-ray field.

To perform your own scientific analysis, please download data and use the official public AGILE software.

To access the preview tool click on "On-line Analysis" in the query output table, under the "GRID Interactive Archive" column. The interactive ASDC tool uses the XIMAGE software package for multi-mission X-ray astronomy (v4.5.1), adapted to gamma-ray image display and data analysis.

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*** Note on AGILE Filters ***
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The standard AGILE event filter is the FM filter, optimized up to 60 deg off-axis. The AGILE Team recommends the use of v3.0 EVT files produced with the FM filter for gamma-ray source standard likelihood analysis.

EVT files produced with the FT3AB filter are also published, but they are delivered with a warning. WARNING: data analysis with event files obtained with FT3AB filter may be more efficient in detecting sources with a soft energy spectrum, but there may be noisy residual artifacts at the border of the Field of View (off-axis angle > 40 deg).

Each filter is associated with its own calibration and diffuse model files. Be careful always to use the calibration and diffuse model files appropriate to the chosen EVT filter type. Calibration and diffuse model files are delivered with the public software release under the directory \$ADC/scientific analysis/data.

\* FM filter: if you use the FM-filtered event file with suffix: \_FM you should always use as an input to scientific software tasks:

- effective area files of type \*FM\*.sar.gz
- energy dispersion files of type \*FM\*.edp.gz
- point spread function files of type \*FM\*.psd.gz
- flux correction files of type \*FM\*.expcorr.gz
- diffuse model files of type \*FM\*.conv.sky.gz

\* FT3AB filter: if you use the FT3AB-filtered event file with suffix: \_FT3AB you should always use as an input to scientific software tasks:

- effective area files of type \*FT3AB\*.sar.gz
- energy dispersion files of type \*FT3AB\*.edp.gz
- point spread function files of type \*FT3AB\*.psd.gz
- flux correction files of type \*FT3AB\*.expcorr.gz
- diffuse model files of type \*FT3AB\*.conv.sky.gz

For further details please follow the instructions given in the Software User Manual.

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Enjoy!