THE SECOND AGILE-GRID CATALOG OF HIGH-ENERGY GAMMA-RAY SOURCES

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ABSTRACT

The second catalog of high-energy gamma-ray sources detected by the AGILE-GRID telescope includes data from the pointing period (July 2007-October 2009). This catalog uses completely reprocessed data using the new FM3.119 filter, new calibration matricies and new version of the Science Tools. AGILE detects hundreds of high-significance sources both a high and low Galactic latitudes. A class of AGILE-only sources is identified.

2AGL catalog

The 2AGL Catalog covers the first 2.5 years of AGILE (the "pointing mode", consists of 134 high confidence AGILE sources for E>100 MeV and ~80 medium confidence level sources.

1. A new background event filter called FM3.119 has been used. The new IRF are called I0025. The principal difference relative to the F4 data used for 1AGL is improved effective area above 100 MeV, and a deep characterization of the Point Spread Function (PSF)

2. We use a much larger data set than the 1AGL (that was based on observations performed from July 9, 2007 to June 30, 2008). The 2AGL catalog is base on the 2.3 years of the entire 'pointing period'.

3. This catalog employs a new model of the diffuse Galactic emission model, in particular for the Galactic center region.

4. We have developed new methods for characterizing and localizing source seeds evaluated for inclusion in the catalog, using both wavelet techniques and an iterative approach to finding seeds.

Class	Number	
Blazar Cand. Unkn. Type	10	
BL Lac	18	
FSRQ	34	
Radio Galaxy	2	NGC 1275, Cen A core
Binaries	2	Eta Carinae, Cygnus X-3
Globular Cluster	1	Terzan 5
PSR	47	
PWN	3	Crab, HESS J1632-478(?), PWN G0.13-0.11
SNR	9	
Potential SNR	7	
Unassociated	80	

Table 1: classification based on spatial localisation

Figure 1, 2, 3: The Cygnus, Galactic center and Carina regions. The figures show the counts maps with both AGILE (white circle are the 95% confidence level) and 3FGL (yellow 95% ellipse confidence level)
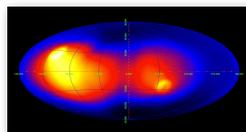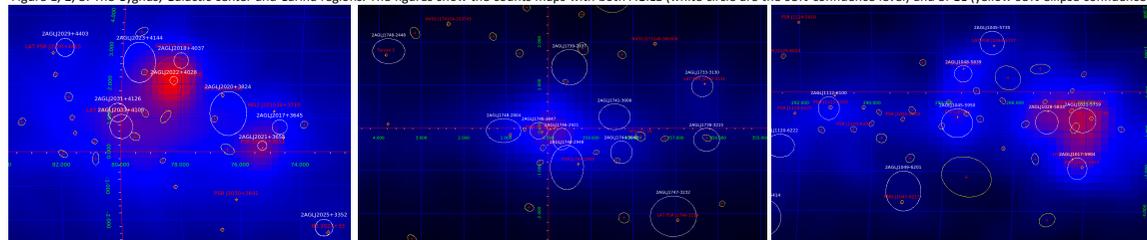

Figure 4: the exposure map