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The First Catalog of Active Galactic Nuclei Detected by the Fermi Large Area Telescope

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We present the first catalog of active galactic nuclei (AGN) detected by the LAT, corresponding to 11 months of data collected in scientific operation mode. The First LAT AGN Catalog (1LAC) includes 671 gamma-ray sources located at high Galactic latitudes ($|b| > 10$ deg) that are detected with a test statistic (TS) greater than 25 and associated statistically with AGNs. Some LAT sources are associated with multiple AGNs, and consequently, the catalog includes 709 AGNs, comprising 300 BL Lacertae objects (BL Lacs), 296 flat-spectrum radio quasars (FSRQs), 41 AGNs of other types, and 72 AGNs of unknown type. We also classify the blazars based on their spectral energy distributions (SEDs) as archival radio, optical, and X-ray data permit. In addition to the format 1LAC sample, we provide AGN associations for 51 low-latitude LAT sources and AGN "affiliations" (unquantified counterpart candidates) for 104 high-latitude LAT sources without AGN associations. The overlap of the 1LAC with existing gamma-ray AGN catalogs (LBAS, EGRET, AGILE, Swift, INTEGRAL, TeVCat) is briefly discussed. Various properties--such as gamma-ray fluxes and photon power law spectral indices, redshifts, gamma-ray luminosities, variability, and archival radio luminosities--and their correlations are presented and discussed for the different blazar classes. We compare the 1LAC results with predictions regarding the gamma-ray AGN populations, and we comment on the power of the sample to address the question of the blazar sequence.

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