Simulated Blazar Surveys

P. Giommi

Simulations main properties and parameters

•Starts from a radio Luminosity function + Cosmological evolution

•Monte Carlo simulation of redshift and radio luminosity

•Radio luminosity extrapolated to other energy bands (micro-wave, optical, X-ray, gamma-ray) based on SSC model + and randomized based on observed distributions

•Gamma-ray flux simulated taking into account of duty cycle and GRB constraints (see Giommi et al. 2005 A&A in press, astro-ph/0508034)

•Sources are accepted above a set of flux limits (radio, opt , X-ray etc.) that can be a function of the position in the sky



RASS-NVSS-GSC2 Blazar candidates



RASS-NVSS Blazar Sample: Identification through Optical spectroscopy using SDSS-DR3 spectra Turriziani et al., in RA=178.51899, DEC=-0.16941, MJD=51943, Plate= 284. Fiber=502 NILL 514 SDSS spectra in Data Release 3 WM MANAMANA 152 BL LACS [59 new objects] Å⁻¹] 164 FSRQs [128] cm⁻² 68 QSOs [36](no radio spectral info) erg [10⁻¹⁷ LC. 63 SSRQs [62] 32 Radio gal/BL Lac transition objects \circ RA=163.42589, DEC=-0.23893, MJD=51909, Plate= 276, Fiber=145 23 ΔII. ç ~68% are genuine Blazars erg cm⁻² s⁻¹ $Å^{-1}$] ~13%QSO with unknown radio spectrum ~12% are steep radio spectrum QSOs [10⁻¹⁷ 0 \sim 7% are other AGN or galaxies ~ ___

4000

5000

6000

7000

8000

9000

RASS-NVSS-SLOAN Blazar Sample: results Turriziani et al. 2005, in preparation



Radio flux distributions

Data from RASS-NVSS-SLOAN Blazar Sample

Simulation



Magnitude distributions

Data from RASS-NVSS-SLOAN Blazar Sample

Simulation



fx/fr distributions



Predicted distribution of gamma-ray fluxes in **RASS-NVSS-SLOAN Blazar Sample** (PRELIMINARY) 1000 About 1000 RASS/NVSS sources above the GLAST sensitivity limit (3.e-9 ph/cm2/s) Number of sources 500 0 10⁻¹¹ 10⁻⁶ 10-5 10^{-12} 10-10 10⁻⁹ 10-7 10^{-8} Flux [ph(>100 MeV)/cm2/s]

A radio flux limited survey (f_lim = 50 mJy, 24,000 blazars in 30,000 sq degrees of sky)



Predicted distribution of gamma-ray fluxes in a 50 mJy radio survey (PRELIMINARY) 8000 About 5,000 radio sources 6000 With f_radio > 50 mJy are above the GLAST sensitivity Number of sources limit (3.e-9 ph/cm2/s) 4000 2000 \bigcirc 10⁻⁹ 10⁻¹⁰ 10⁻⁷ 10⁻⁶ 10⁻⁸ 10^{-11} 10⁻⁵ 10^{-12}

Flux [ph(>100 MeV)/cm2/s]