DC2 activity at ASI Frascati

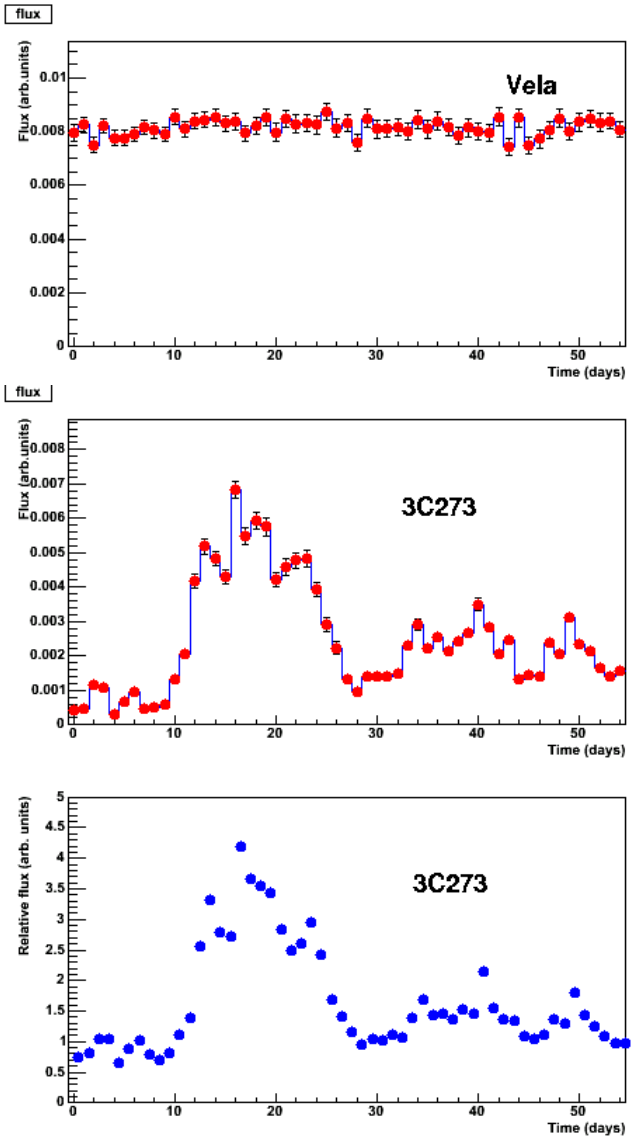
3 people on DC2, in particular on the identification of blazars
S Cutini, D. Gasparrini, P. Giommi

List of candidates:
http://www.asdc.asi.it/roxa/

The ASDC ROSAT-NVSS-SDSS-2dF Blazar Sample (819 entries)

Turriziani et al. in preparation (A&A)

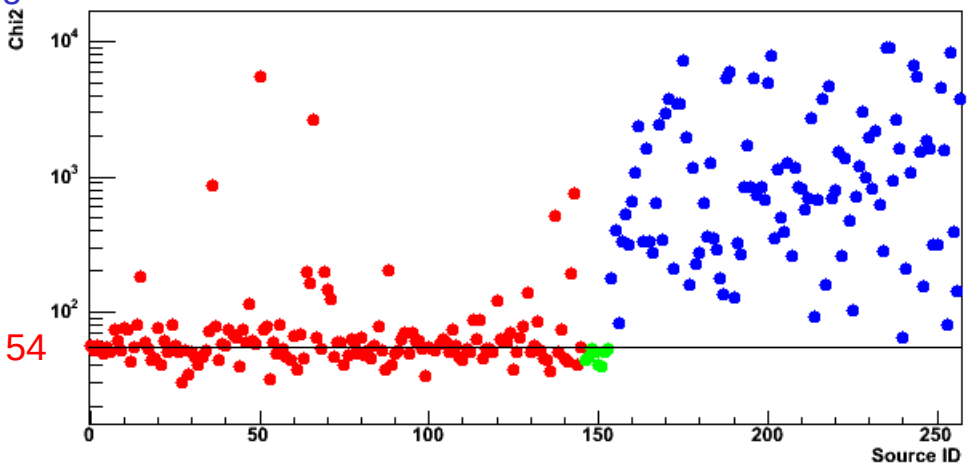
Simple variability analysis



"Pedestrian approach"

- Production of 55 one-day flux maps (corrected for diffuse backgrounds)
- Flux integrated over a radius of 2 deg. around the position of a known source
- Analysis of the "light curve": chi-square of the flux distribution

Log. scale

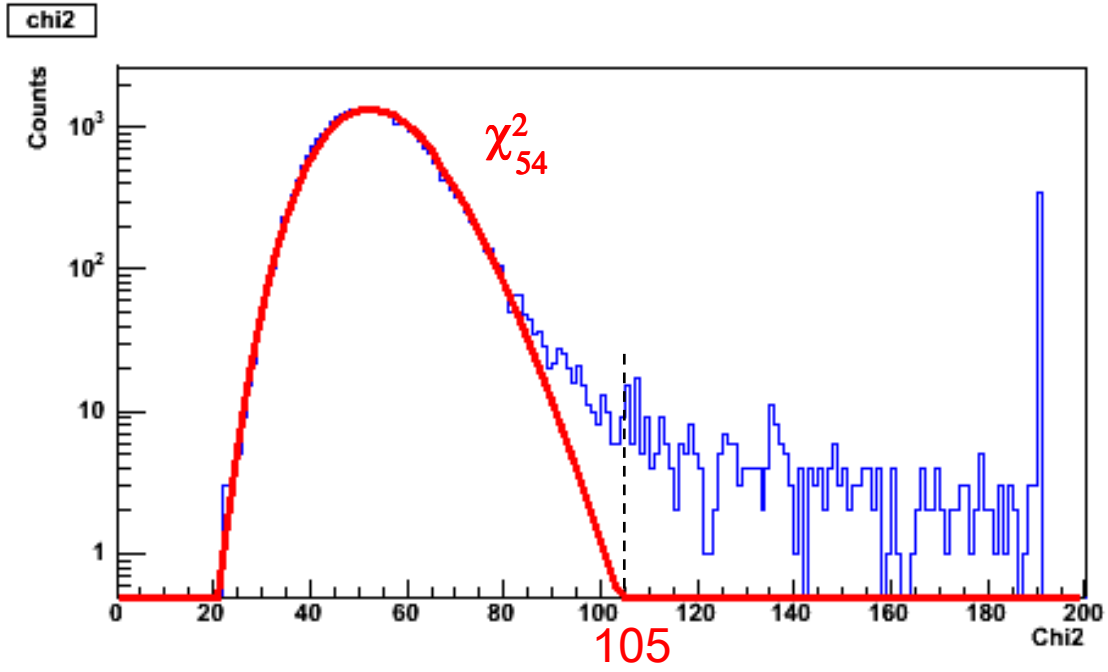


54

red: non-variable, non-identified sources
green : pulsars
blue: blazars

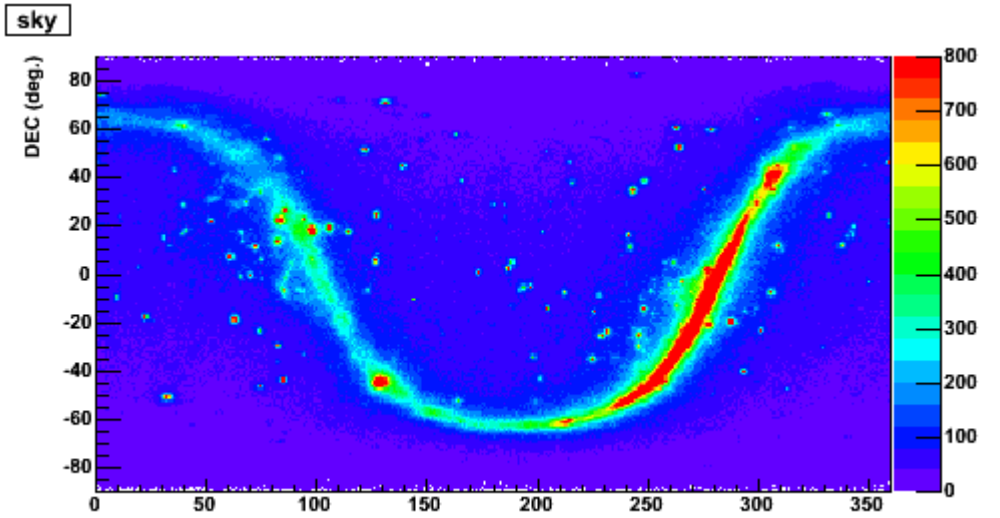
Transient detection

The variability study was done using a pre-established source catalog.
To detect transients whose average flux does not exceed the catalog sensitivity limit, the whole sky must be scanned.
For each (ra,dec) pixel, one calculates the chi-square of the distribution of the flux measured for each day in the 55-day time period (the pixelization is not optimized…).
For non-variable sources, the resulting chi-square distribution behaves as χ^2_{54}.
(method equivalent to that of McLaughlin et al. used for EGRET)

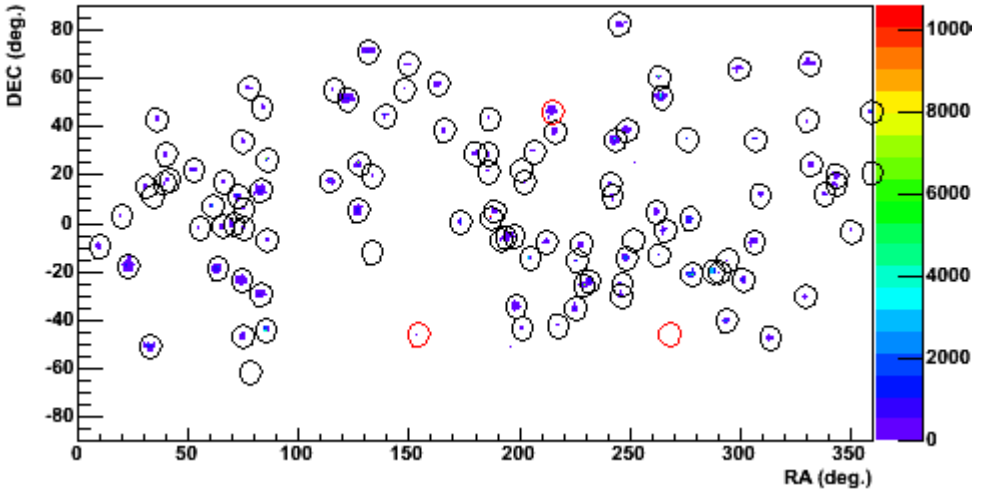


First results

All sky



Pixels with chi-square>105
- clustered (≡sources)
- black circles: blazars
 (> 90 out of 105)
- red circles: bright GRBs



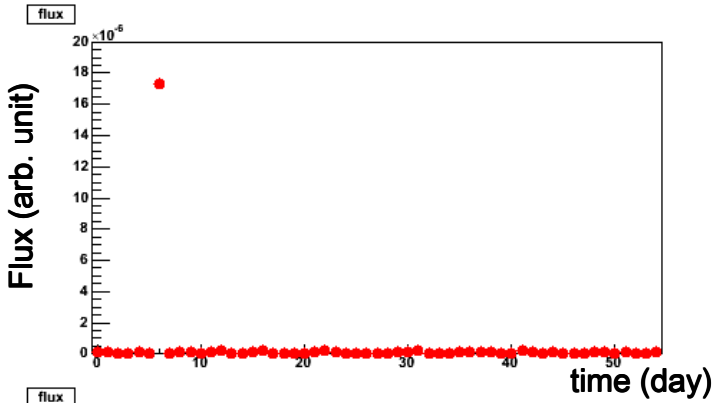
Other prescriptions (excess > n σ) have been tested.

To do:

- optimize pixel size (at least same solid angle!)
- estimate sensitivity vs false detection rate…

GRBs (i.e. “transient phenomena”)

>1800 photons:
easy!



110 photons:
much more difficult…
~6 σ excess