

COMMENT ON CATALOG SEARCHES

Peter TINYAKOV

University of Brussels (ULB)

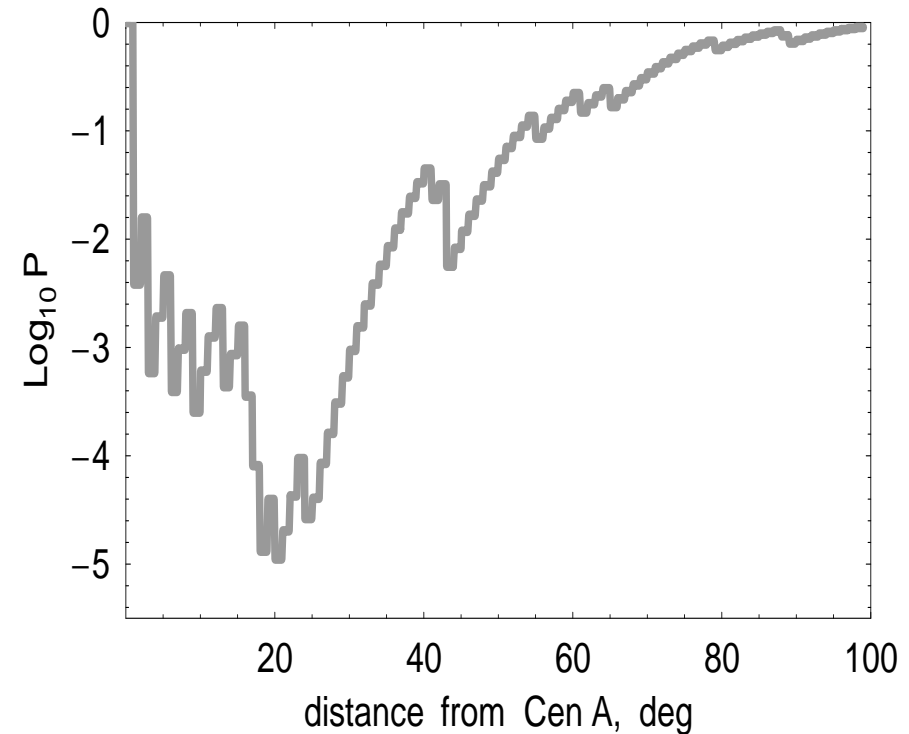
*Gorbunov, P.T., Tkachev, Troitsky,
arXiv:0711.4060 [astro-ph]*

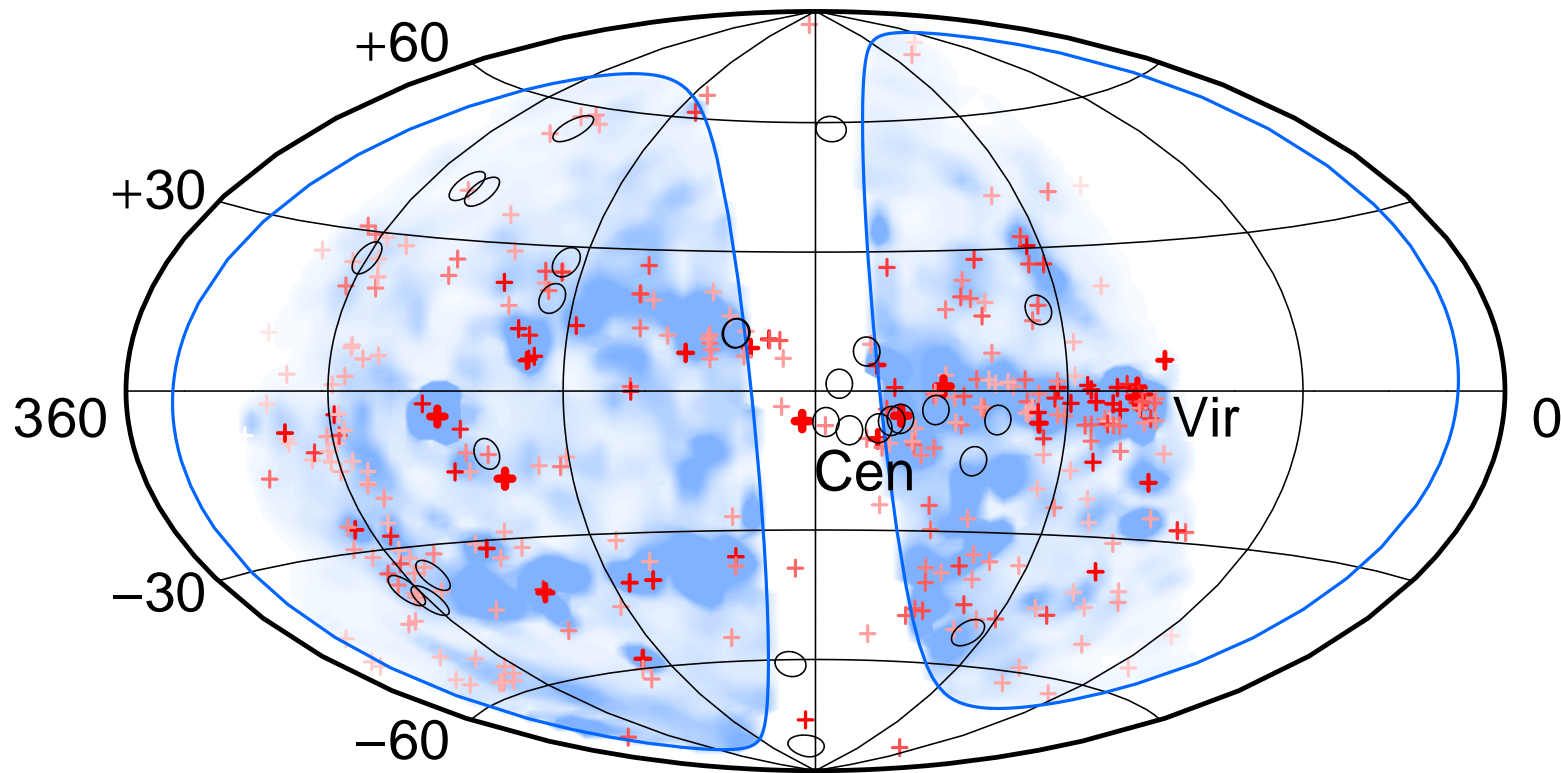
I. Correlations with Active Galactic Nuclei (AGN) do not automatically imply that AGN (or other objects distributed in a similar way) are sources. Alternative interpretations are possible.

- * Correlation analysis compares data to a *uniform* distribution. If there is a correlation signal, it means only that the distribution is *not uniform*. It does not tell anything about the actual sources.
- * Possibilities of misinterpretation increase if the candidate sources are themselves distributed non-uniformly over the sky. This is the case, for instance, for nearby AGNs.
- * Consider a particular example — take one object, Cen A, instead of the AGN catalog in the correlation analysis.

- * The probability to obtain by chance the excess of CR events within given angle from Cen A, as a function of the angle.

Each step down is the actual event entering the circle of a corresponding angular distance from Cen A.





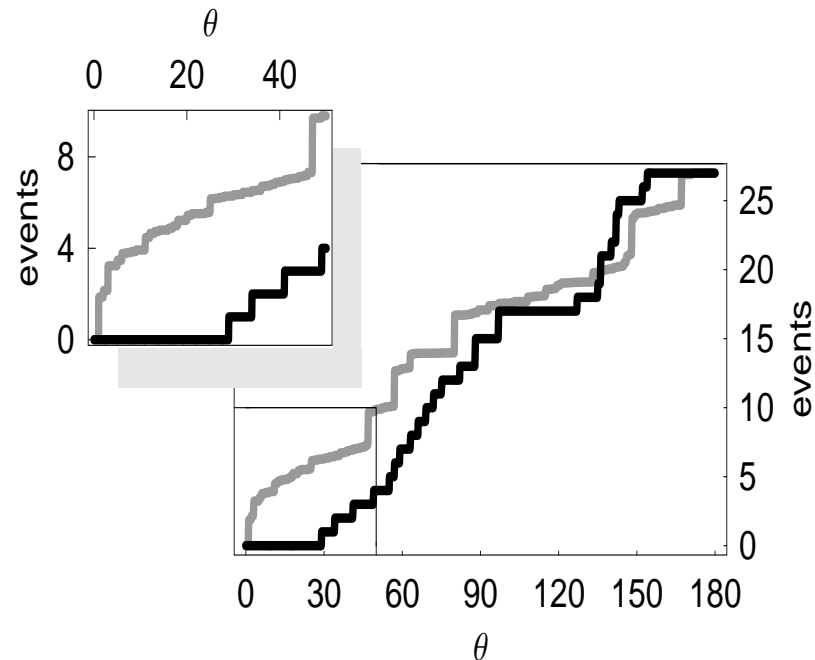
Sky map in supergalactic coordinates.

II. To identify sources, we must look for other signatures

- * Consider the hypothesis that AGN are sources.

This allows to predict the distribution of the CR over the sky, which may be then compared to the distribution of real events.

From various tests, these distributions are *inconsistent* at the level of $\sim 99\%$.



\implies The AGN hypothesis seems disfavored by the existing data.