# ULTRAVIOLET EXCESS QUASAR CANDIDATES IN LARGE FIELDS: A STATUS REPORT CONCERNING THE NGC 450 AREA.

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ABSTRACT. New results are presented based on several statistical analyses of a 25 square degree field around NGC450. They include the detection of a clustering on a small scale ($\simeq 10$ arcminutes) and possible large scale inhomogeneities.

This paper is in fact a status report on a long term program initiated in 1981 with the aim of collecting new and extensive observing material on the background density, the distribution and the luminosity of quasars in fields near bright galaxies as well as far from them. This project is intended to give further evidence for or against the location of quasars in superclusters, in the vicinity of irregular galaxies, or nearby their companion(s) etc. Three large ($5^{o} \times 5^{o}$) fields have presently been surveyed: one near the irregular galaxy NGC450, another one near the amorphous galaxy NGC520 and the third one coinciding with the ESO field nb 300 at $\alpha = 3$ h., $\delta = -40^{o}$ which is essentially void of any particularly bright or active galaxy.

The surveys are carried out on U/B dual image ESO or Palomar Schmidt plates for which the exposure times were adjusted in order to obtain similar images in both the U and B filters for a U-B index of about -0.4 mag. Plates have been scanned at least four times by two different persons in an unbiased homogeneous and objective manner. Preliminary results have already been reported for the NGC 450 field (Swings et al.,1985, Rev. Mex. Astron. Astrof.,10, 91) and will not be repeated here.

One, two and three dimensional distributions of quasars and of quasar candidates are being investigated using several statistical methods. These are: Multiple Binning Analysis (MBA) with classical tests as well as with randomisation ones (Gosset and Louis, submitted to

Astrophysics and Space Science), Nearest Neighbours
Analysis (NNA), Correlation Function Analysis (CFA),
Power Spectrum Analysis (PSA) and the Extended Kolmogorov
Smirnov (EKS) test. We restrict ourselves here to outline
the main results relative to the two dimensional ($\alpha$, $\delta$)
distribution of objects in the field of NGC450. Three
samples have been considered: primary + secondary
candidates(140), primary candidates (94) and confirmed
quasars (60). All three samples deviate from uniformity
and randomness in the same manner, although not to the
same extent. MBA with the 4 within 16 randomisation test
as well as EKS, and possibly also the PSA, detect large
inhomogeneities with a scale of the order of the size of
the field. This cannot be attributed to a center-to-edge
effect. On the other hand, NNA reveals that the three
first nearest neighbours of an object are too close to
one another with respect to uniformity. This is confirmed
by the CFA which detects an overpopulation up to angular
distances of 10 arcminutes. PSA and MBA with the 4 within
16 randomisation test both detect a clustering with a
characteristic scale of about 10 arcminutes. The effect
is stronger for the confirmed quasars'sample than for the
two other ones. Thus, this 10 arcmin clustering can
provisionally be considered as being a characteristic of
the distribution of the quasars in the investigated
field. The significance level is of the order of .05. A
more detailed and complete analysis will be published
elsewhere.

It should be mentioned that low resolution
spectroscopy has already been performed for a fair number
of quasar candidates in the three fields mentioned above.
High resolution spectroscopy has been obtained for
several interesting targets: some results are presently
being reported concerning the doublet Q0107-025A, B
(Surdej et al, Astronomy and Astrophysics, in press) and
the triplet Q0118-031 A, B, C (Robertson et al, MNRAS, in
press). In addition, faint UBV photoelectric photometry
sequences up to B $\lesssim$ 19.5 mag. have now been obtained with
the ESO 1 m and Las Campanas 2.5 m telescopes in small
areas of the three different fields in order to establish
the values of the limiting magnitudes and of the U-B
thresholds.Grism plates of small areas are being studied
as well.

A more complete account of the surveys briefly
presented here is in preparation and will contain quasar
candidates, luminosities, U/B excesses, representative
spectra, line identifications, data on line strengths and
on redshifts. Furthermore, the results of the above-
mentioned statistical analyses of the distribution of the
different objects will be described and analyzed in
detail.