

QUASAR CLUSTERING AROUND THE SCULPTOR REGION

D. Kunth
Institut d'Astrophysique
Paris, France

W.L.W. Sargent
California Institute of Technology
Pasadena, USA

ABSTRACT. The Sculptor Region has been searched for quasar candidates: three IIIa-J objective prism plates from the UK Schmidt-telescope centred around the NGC55 and NGC300 galaxies have been used. 76 quasars have been found doubling the number of quasars previously known in this field. A test using Monte-Carlo simulations to reshuffle redshifts of the quasar sample shows that a simple eye examination of the simulated distributions produces as many quasar pairs or associations than in the original field. A further preliminary quantitative study using the autocorrelation function shows that quasar clustering is absent on any scale from 10 to 3500 Mpc ($H_0=100$).

THE QUASAR SURVEY

Our initial goal has been a visual search of objective prism plates to discover bright quasars around NGC55 and NGC300. Further sensitive Ca absorption studies are planned to map metallic absorption in quasar spectra out to large radii around these nearby galaxies. Three plates have been taken at low dispersion and among hundreds of candidates we have spectroscopically observed about 170 objects and found 76 new quasars. Spectra were taken with the Las Campanas Intensified Reticon at the 100-inch Cassegrain spectrograph at low dispersion giving redshifts to an accuracy of ± 0.01 except for few BAL QSOs for which line profile fitting is needed. A full account of the survey is given in Kunth and Sargent (1986).

A visual search is very subject to selection effects because it remains very hard to maintain the same search criteria all along the plate examination. The distribution of the objects is thus very clumpy and non-uniform as it is shown in Figure 1 and varies from field to field according to the quality of the plate. The distribution of magnitudes has a broad peak at about 18.8 similar to the distribution found by Osmer and Smith (1980). However while the limiting magnitudes are roughly the same, the number density of quasars found in this work largely exceeds (76 quasars in about 110 deg^2) the one reported by Arp (1984a) and Osmer and Smith (1980) for the same fields. This shows the limitations of the visual technique whenever aimed to discuss statis-

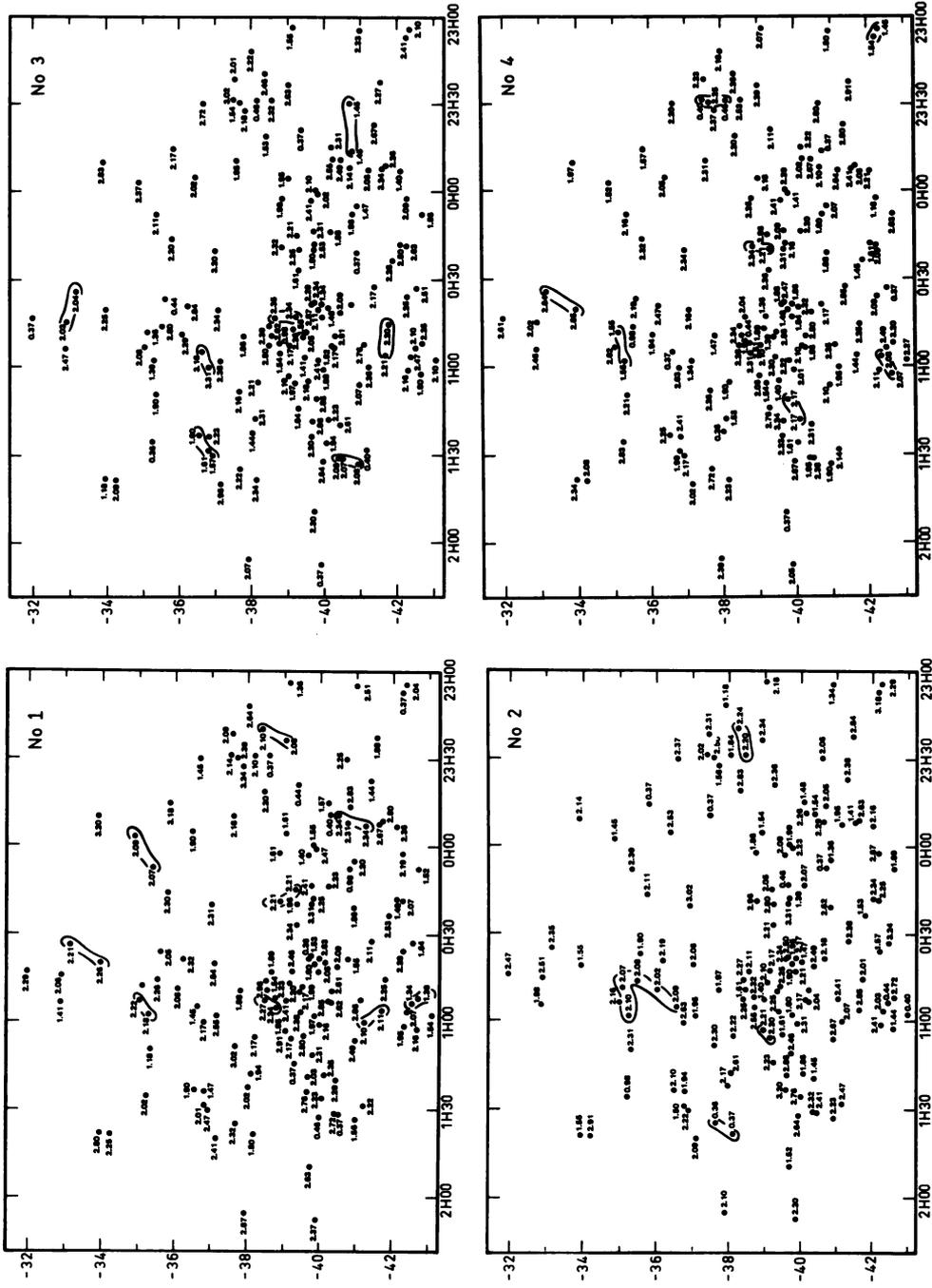


Figure 2 : Four simulated distributions with shuffled redshifts. Pairs and groups suggested by eye examination are encircled for illustration.

there is no reason to find any preferential redshift value within the range set by the objective prism technique. We have made the exercise of plotting some of the simulated distributions for illustration purpose and reproduced some of them (chosen at random) in Figure 2. It is interesting to see that as many pairs and groupings are found in the test fields than in the original one. This gives a visual illustration for the need to step on more quantifying estimates of the tendency of quasars to cluster.

References

- Arp, H., 1984a, Ap.J., **285** , 547
Arp, H., 1984b, Ap.J., **285** , 555
Clowes, R.G., 1981, M.N.R.A.S., **197** , 731
Kunth, D., Sargent, W.L.W., 1986, A.J., in press
Osmer, P., 1981, Ap.J., **247** , 762
Osmer, P., Smith, M.G., 1980, Ap.J. Suppl., **42** , 333.