VISTA SCIENCE COMMITTEE : KEY PROGRAMME PROPOSAL

Addendum: Very high redshift quasars with VISTA

Date : August 2000

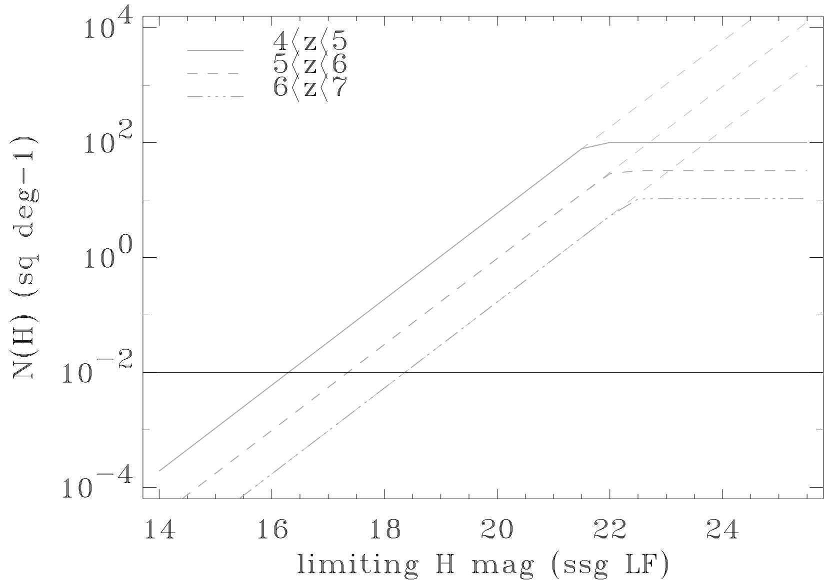
[printed August 2, 2000]

SUMMARY

This is an addendum that contains some plots done subsequent to the discovery of the SDSS 1044 with z=5.8(Fan etal, 2000; astro-ph/0005247]. The plots include:

- r−z v z−-K to be viewed in conjunction with the r−z v z−J plot in the original proposal. z−K is used instead of z−J since K band photometry exists for some SDSS QSOs. Only 2 are plotted at the moment.
- various colour-colour combinations that relate to z>7 QSO selection. e.g. i band drop-outs using iz[J,H,K], z band droputs using z,J[H,K]. In the case of zJ[H,K], L and T dwarfs will contaminate the QSO sample.
- expected surface densities for H and K band limited surveys. The fiducial horizontal line is drawn at $0.01\mathrm{deg}^{-2}$. 1 per $500\mathrm{deg}^2$ is probably a more abitious target with a goal of finding 10 in $10{,}000\mathrm{deg}^2$.

Except where explicitly mentioned all quoted magnitudes are on a Vega based normalisation.



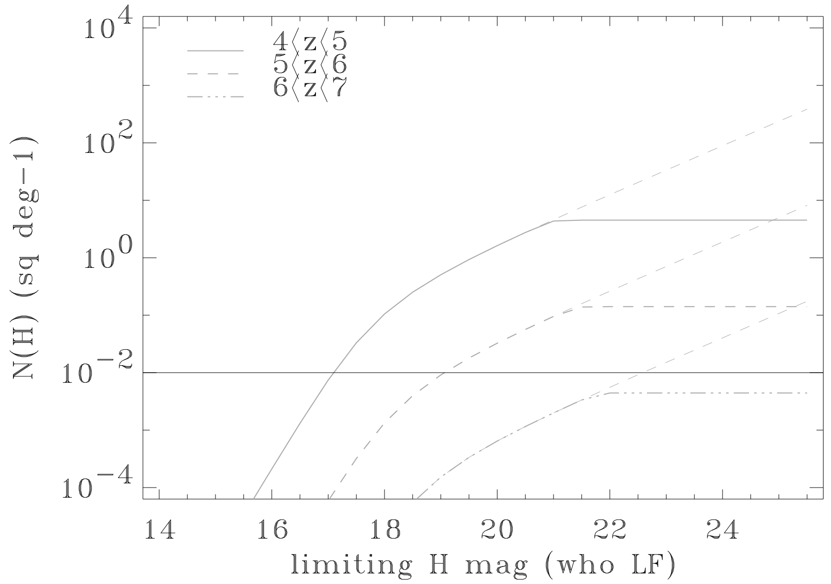


Figure 1: The predicted number of quasars per square degree as a function of apparent H magnitude is shown for the two luminosity functions in figure 1. The horizontal line indicates a fiducial surface density of 1 quasar per 100 $\deg^2$. The upper plot is for SSG and the lower plot is for WHO

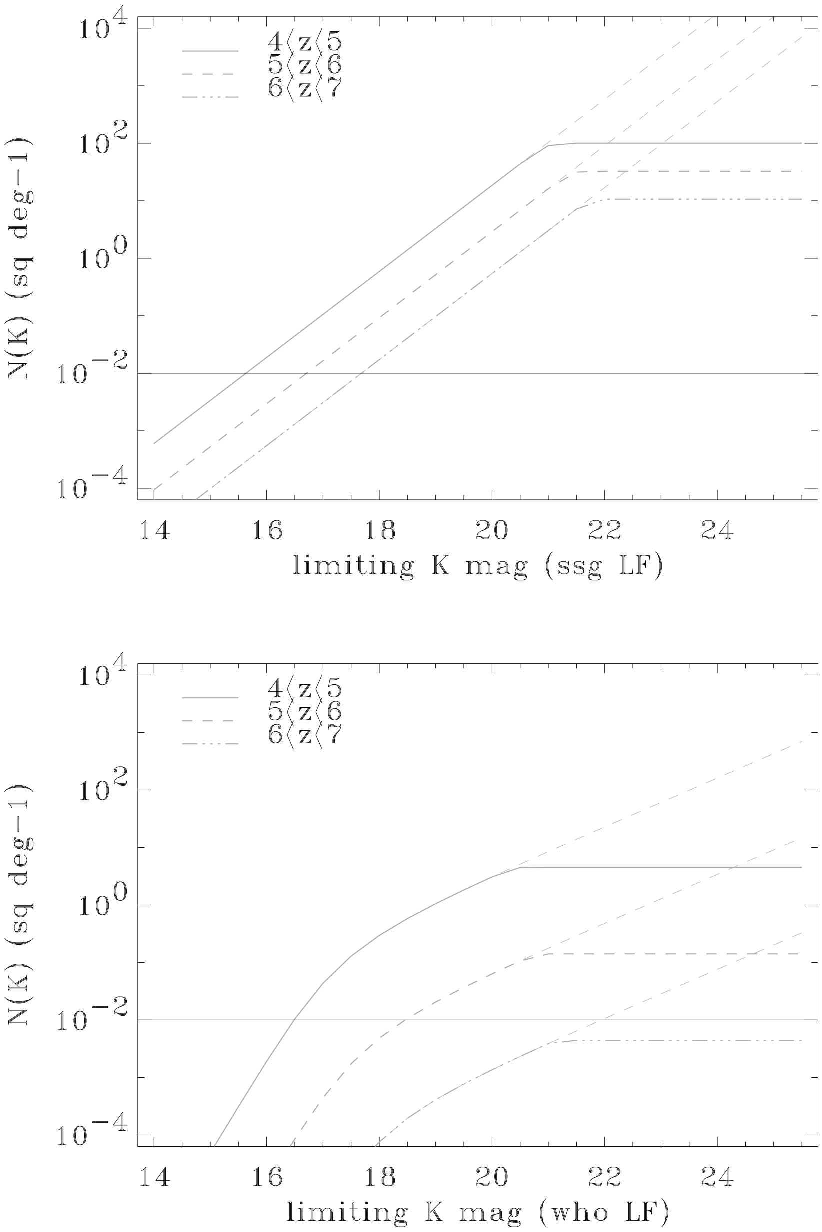


Figure 2: The predicted number of quasars per square degree as a function of apparent H magnitude is shown for the two luminosity functions in figure 1. The horizontal line indicates a fiducial surface density of 1 quasar per 100 $\deg^2$.

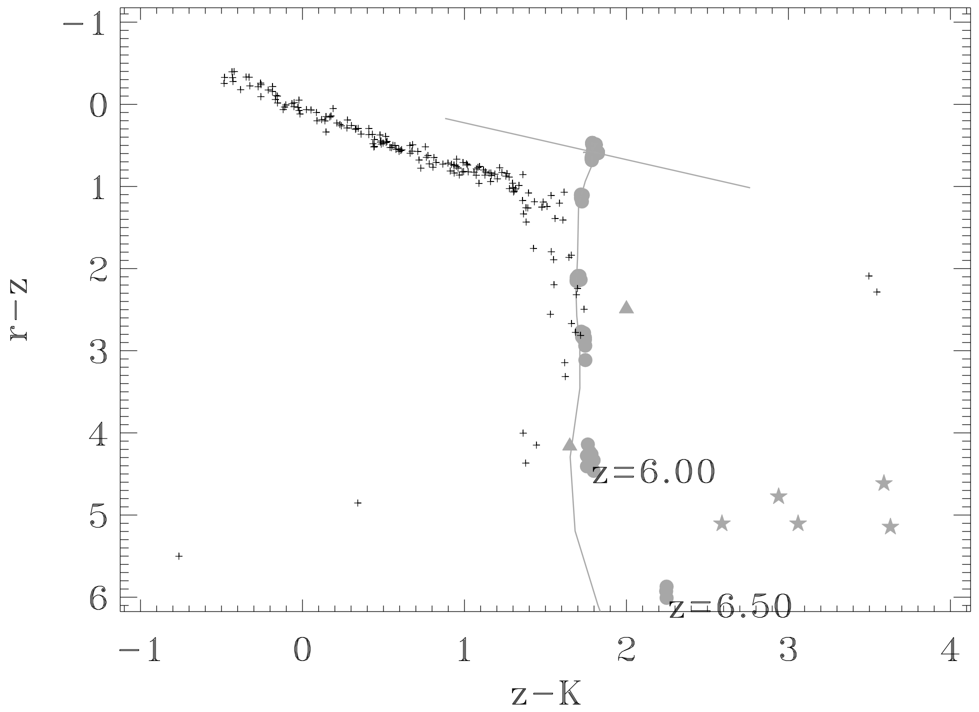


Figure 3: Theoretical r-z, z-J colour-colour diagrams. The crosses are colours for stars calculated using the Gunn & Stryker(1991) stellar atlas with the Persson extension into the IR(from SYNPHOT in STSDAS). The filled circles are quasar colours that have been simulated using the monte-carlo approach described above for two different continuum spectral indices -0.50 and -0.75. The solid wobbly line is quasar colours calculated using the analytic IGM model proposed by Madau 1995. The differences between the two approaches are beyond the scope of this study. The solid line near the top shows the effect of underlying spectral index on colours. Yes, we could also add a reddening vector. The 'stars' are the SDSS L and T dwarfs. The triangles are the z=5.8 SDSS QSO and another z=5.2 QSO with rizJK photometry. The z=5.8 QSO does not have J band photometry so it is only plotted on the plots with K.

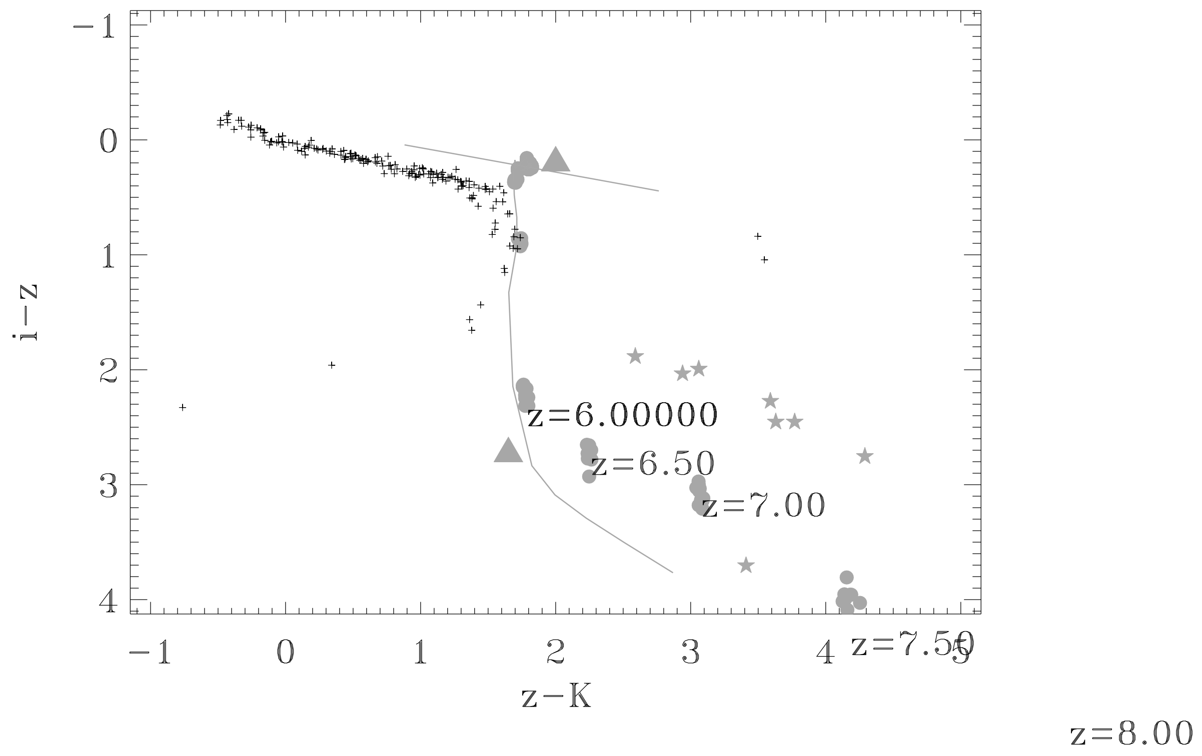


Figure 4: izK

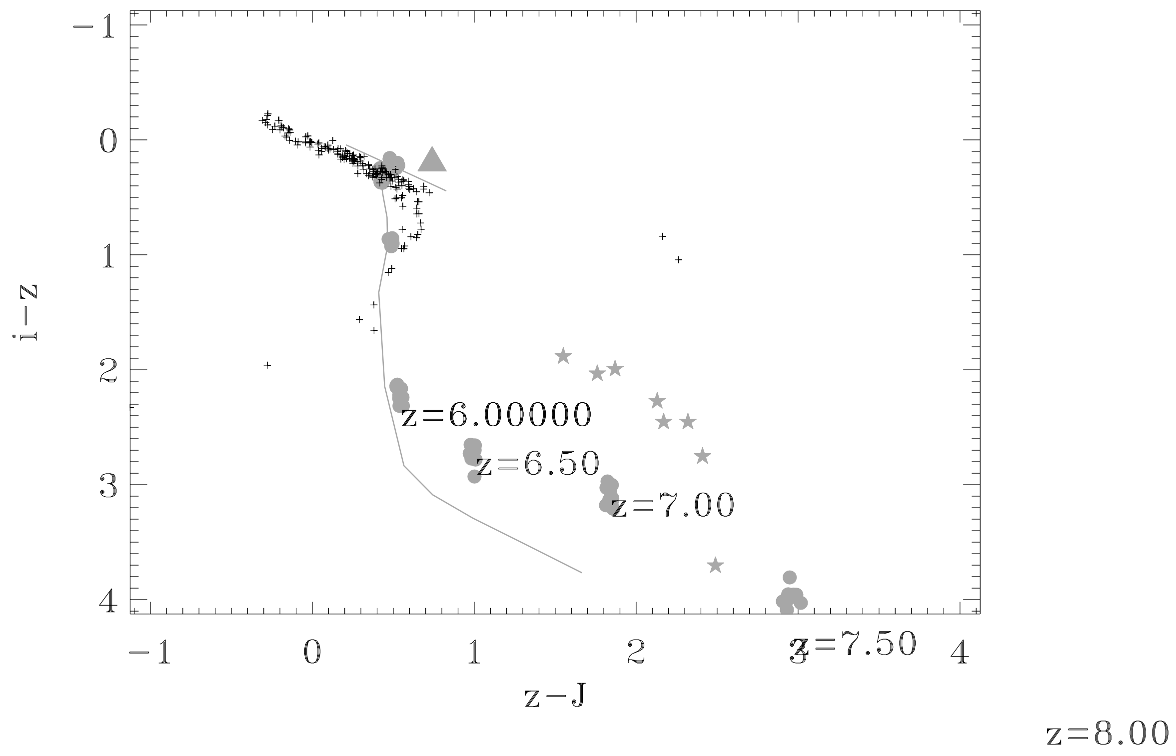


Figure 5: izJ

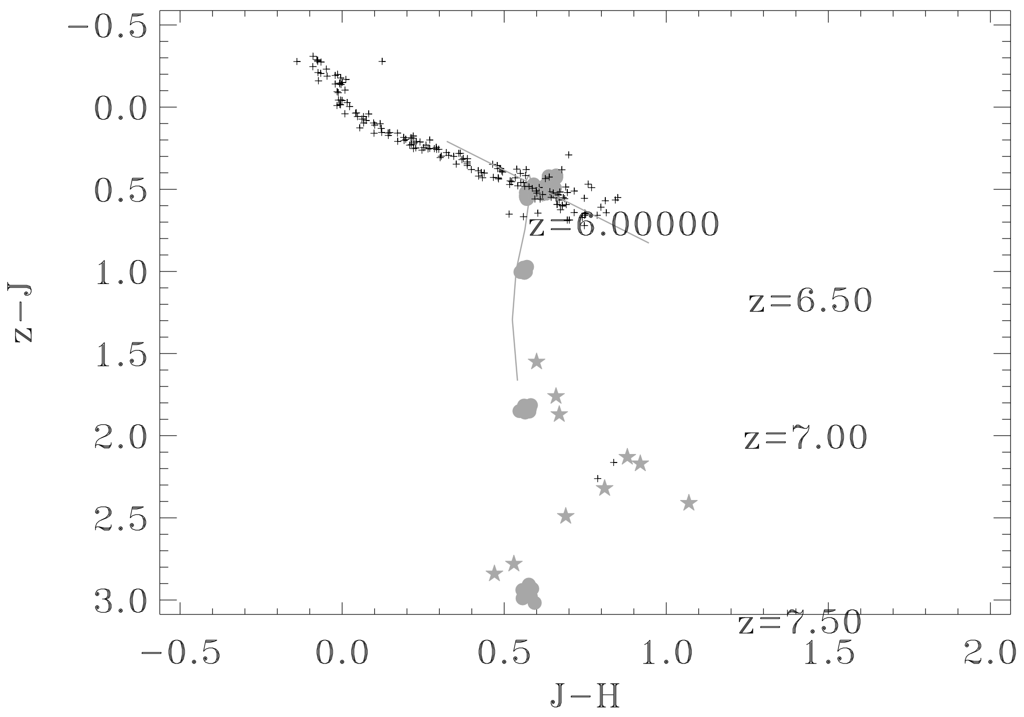


Figure 6: zJH

z=8.00

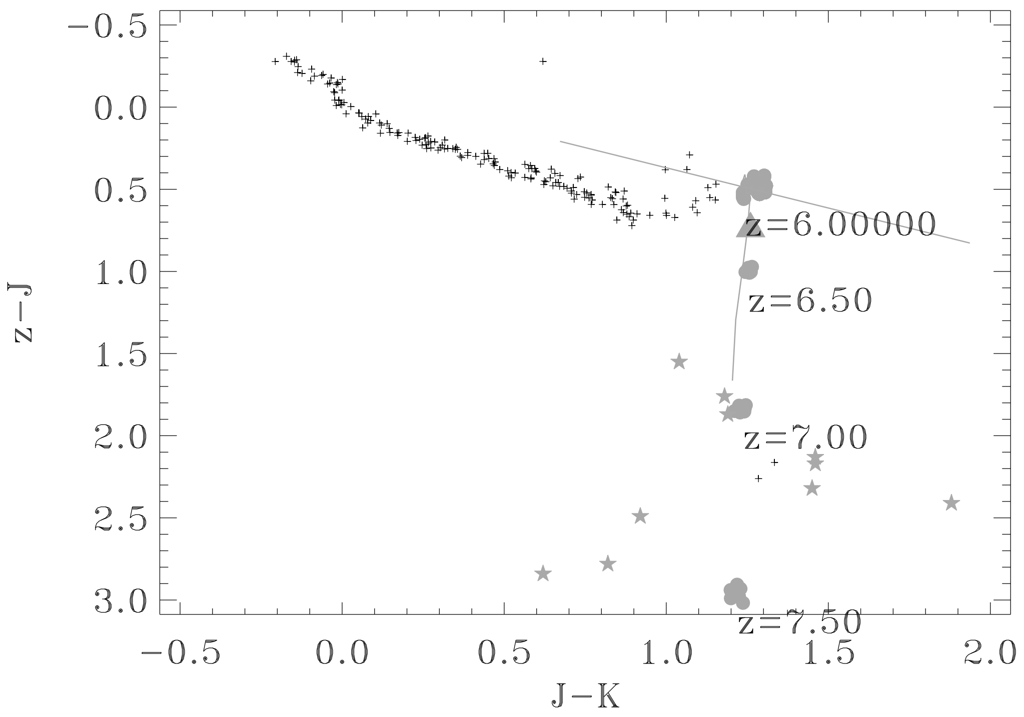


Figure 7: zJK

z=8.00