

Photometry and Stellar Structure Analysis of the Central Regions of the M33 galaxy

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Abstract. The UK InfraRed Telescope/UFTI instrument was used to analyse stars in the central region (square kpc) of the M33 galaxy over 3 nights in August 2005 with observations in K-band. Photometry was obtained for all stars by fitting appropriate PSF models, using DAOPHOT package (Stetson 1987). Around 18500 stars were detected. A master image was produced by applying an appropriate shift to each image and combining all 30 images. The final catalogue was obtained by assigning unique ID numbers to all stars and calibrating instrumental magnitudes. Comparing the UFTI and the UIST catalogues (Javadi *et al.* 2011) shows that a larger number of stars were detected with the UFTI, reaching a K-band limiting magnitude of 18.5 mag. Cross correlation methods were employed to cross match our catalogue with a previous monitoring survey in the near-infrared, the UIST catalogue. As a result, we assigned J magnitude and J-K color index to those stars which were found in both catalogues. Using these stars, a color-magnitude diagram was produced which shows populations of RGB, AGB and Carbon stars. Isochrones from Marigo *et al.* (2008) for solar metallicity and a distance modulus of 24.9 magnitude were used to identify different populations in the central region of the M33 galaxy. We will merge the UFTI catalogue with the UIST and the WFCAM, to get better coverage of stars in the central square kiloparsec.

Keywords. stars: evolution — galaxies: individual (M33)

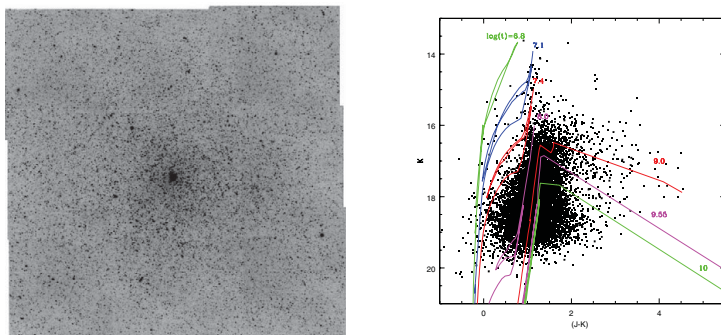


Figure 1. (Left:) UFTI K-band mosaic.(Right:) CMD of (J-K), Overplotted are isochrones from Marigo *et al.* (2008) for solar metallicity and a distance modulus of 24.9 mag.

References

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