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OTELO: THE STELLAR COMPONENT OF THE GROTH FIELD

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OTELO, the key OSIRIS science project is a deep emission line object survey to be performed with the OSIRIS Tunable Filters in selected atmospheric windows relatively free of sky emission lines (Cepa et al. 2006; Cepa et al. 2005).

An auxiliary broad band survey has been undertaken in order to provide morphological classification, photometric redshifts, environment of the sources, percentage of emission line targets and approximate population synthesis.

The sky region called GROTH is one of the selected field as part of the OTELO project. GROTH is a commonly observed sky region for different scientific aims in extragalactic astronomy. Observations in B, V, R and I filters were carried out using the PF of the WHT (Observatorio del Roque de los Muchachos, La Palma, Tenerife, Spain). Total area covered was 0.18 deg^2. Reduction have been done following standard steps using IRAF packages. For absolute astrometry, the USNO B1 catalogue has been used. To extract sources, we have applied Sextractor2.2 (Bertin & Arnauts 1996).

For photometric calibration we have selected a sample of stars matching common stars in all frames in each filter with Sloan Digital Sky Survey (SDSS) stars. Transformations between SDSS and Harris filters were fitted using magnitude equations in the form:

$$M1 - M1_{SDSS} = a_1 + a_2(M1_{SDSS} - M2_{SDSS}) \quad (1)$$

Images with very different transformations coefficients are rejected. We combine all good images in each filter, and then we perform a new fit for combined images and we calculate coefficients in the transformation equations. With these coefficients we determine colors and finally the apparent magnitudes of the objects. Final average zero point is obtained comparing apparent magnitudes for common objects in the three pointings (two-on-two).

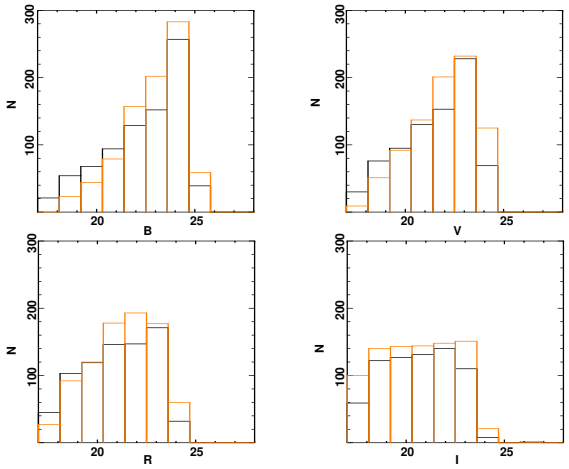

Fig. 1. Comparison of stellar number counts in each photometric band for our catalogue of stars (black) and Besançon models (grey).

Final catalogue has $\sim$ 40000 objects. We have selected as stars the objects that have been detected in all filters and with a stellarity >0.9. A 2% of total sources are stars. In order to estimate limiting magnitude, we have made simulations of artificial point sources in background real images. We have obtained 26 mag in B, V, and R bands (at 50% efficiency) and 24 mag in I band.

We have compared our number counts and color distributions with results of the Besançon models (Robin et al. 2003). The agreement between our observations and the model predictions gives confidence about our photometric calibration and the completeness of our catalogue.

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