Multi-passband search for galaxy clusters in CFHTLS D1

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Abstract. We compare the results of applying different cluster detection methods to photometric data obtained for the Deep-1 field of the Canada-France-Hawaii Telescope Legacy Survey. The poster can be downloaded at http://www.dark-cosmology.dk/∼lisbeth/cfhtls_clusters.pdf

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The Canada-France-Hawaii Telescope Legacy Survey (CFHTLS) is an ambitous imaging survey aimed at covering a total of 170 square degrees in 5 passbands. These data are planned to be deep ($i \leqslant 25$) and wide and are thus well-suited for comparison of different galaxy cluster detection methods in particular at high redshifts. This is the first such comparison where we focus on the Deep-1 field, which covers 1 square degree. We compare the results of a matched-filter detection method (Olsen *et al.* (2006)) applied to the $r-$, $i-$ and $z-$band data and a search for overdensities in photometric redshift space (Mazure *et al.* (2006)).

Applying the matched filter detection method to the 3 passbands yielded 34, 46 and 50 candidate clusters. The difference originates in the 4000Åbreak shifting towards redder passbands with redshift. Visual inspection of the identified clusters show that in general about 80% of the candidates show a concentration of galaxies. Comparison between the different passbands show that at low-z ($z \lesssim 0.5$) the $r-$ and $i-$band do not differ significantly. At high-z ($z \gtrsim 1$) the $z-$band is mandatory to get all the high-z candidates. For the photometric redshift catalogue we find 36 detections of which 11 have a counterpart in either the $i-$ or $z-$band MF catalogues. For the 11 matched cases the matched-filter redshift estimates are in good agreement with the photometric redshift estimates. Of the 11 matched cases 82% are among the robust cases based on visual inspection.

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References

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