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The Build-up of the Colour-Magnitude Relation

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Abstract. We discuss the build-up of the colour-magnitude relation. The colour-magnitude relation first appears at the bright end and the faint end appears later. Interestingly, the build-up of colour-magnitude relation is delayed in low density environments. We suggest that galaxies follow the environment-dependent down-sizing evolution.

Keywords. galaxies: clusters: general, galaxies: evolution, galaxies: fundamental parameters

1. Motivation and Observation

Galaxy properties are known to strongly depend on environments in which galaxies reside. However, the origin of the environmental dependence is still unclear. To improve the situation, we carry out a systematic survey of galaxy clusters (Kodama *et al.* 2005). As part of this project, we observed CL0016 (z=0.55) and RXJ0152 (z=0.83).

2. Results and Discussion

We examine colour-magnitude diagrams (CMDs) of galaxies in cluster, group, and field environments as shown in Fig. 1. We observe the build-up of the colour-magnitude relation (CMR). The CMR first appears at the bright end and faint end appears later. This confirms 'down-sizing' in star formation. Interestingly, the build-up of the CMR is delayed in low density environments. That is, down-sizing is delayed in low density environments. We therefore suggest that galaxies follow the environment-dependent down-sizing evolution. Further details can be found in Tanaka *et al.* (2005, 2006)

References

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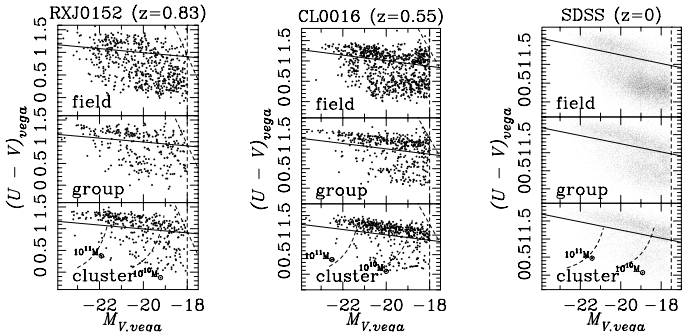

Figure 1. The rest-frame CMDs ($U-V$ versus M_V) in RXJ0152 ($z=0.83$), CL0016 ($z=0.55$) and SDSS ($z=0$). The solid line shows the CMR shifted blueward by 0.2 mag.