

**A study on the multicolour evolution of
Red Sequence galaxy populations:
insights from hydrodynamical
simulations and semi-analytical models**

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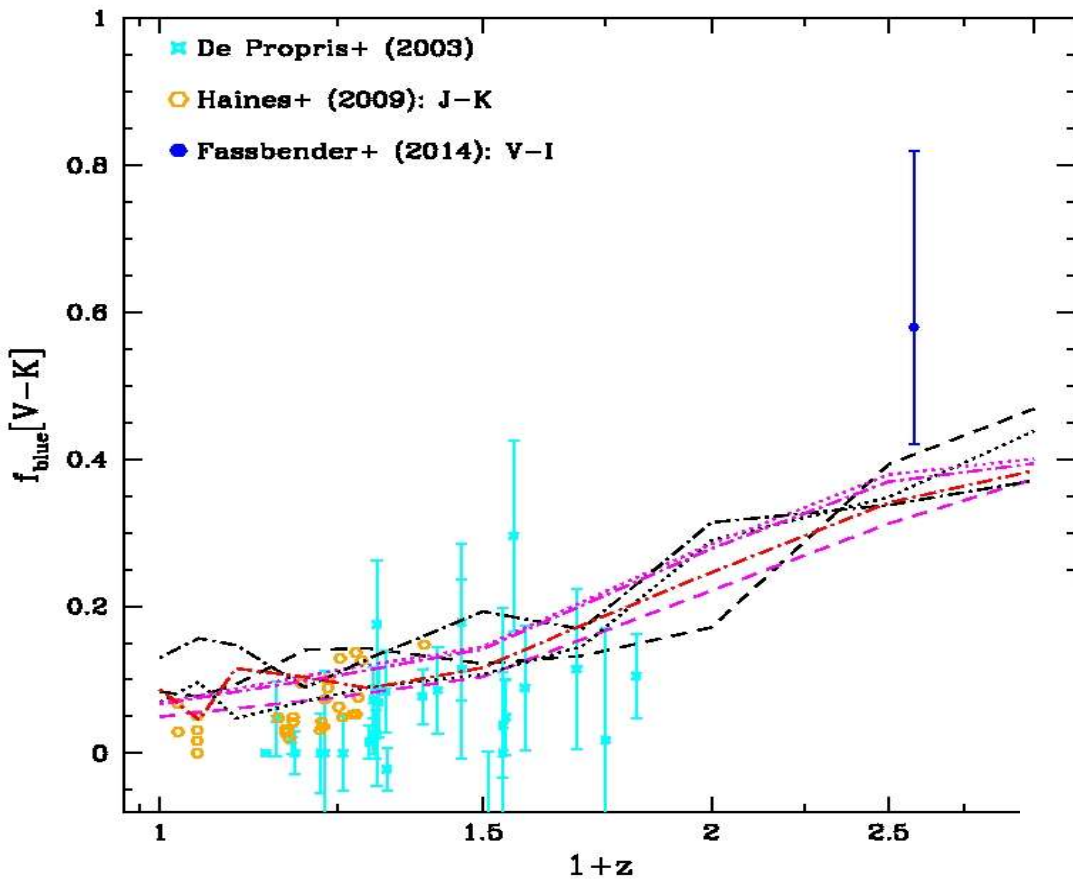
(PMO Nanjing)

Methods

- Cosmo-hydro-chemo-dynamical zooming-in simulation (**SIM**: Romeo+2008) + **SAM** (Kang Xi+ 2008)
- Two diagnostics: **red/blue fractions & RS-LFR**
- Different selection criteria for RS: 1) quiescence degree from sSFR, 2) U-V/V-K colour-colour plane. In both cases, colour & magnitude thresholds let evolving with redshift.

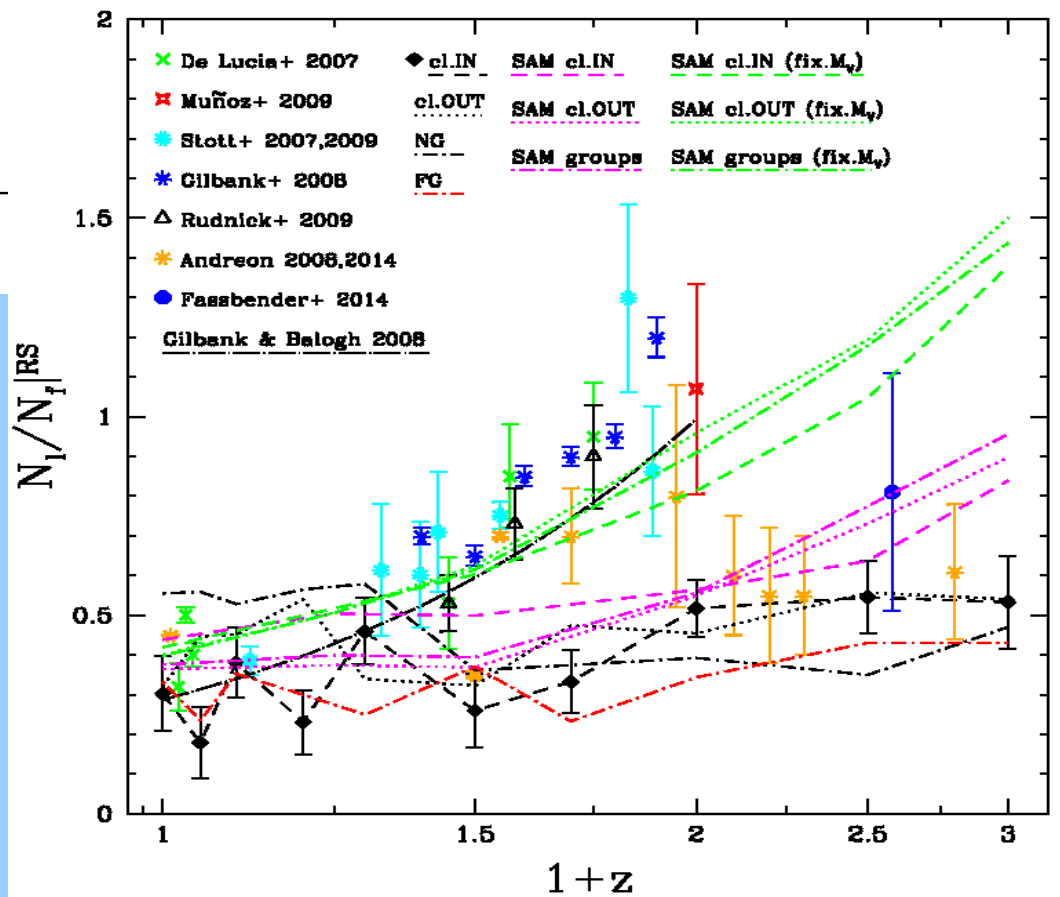
Results

- BO effect is λ -dependent: f_{bl} increasing steeper in optical-optical than in NIR-optical colours.
- Steeper blue fraction reproduced only when choosing an optical fixed luminosity-selected sample, but **flatter** when selecting by stellar mass or evolving magnitude limit: agreement with De Propriis+2003, Haines+2009.
- Also the RS-LFR is strongly dependent on the selection: very **mild evolution** when using a mass-selected sample, in agreement with some of the highest redshift confirmed proto-clusters (e.g. Fassbender+2014).
- **No dearth of red dwarfs** at $z>1$ from both models: agreement with Andreon+2014, in contrast with De Lucia+2007.
- Environment dependence: normal groups and cluster outskirts present the highest values of both star forming fraction and LFR at low z , while fossil groups and cluster cores the lowest; groups begin to split after $z\sim 0.5$.
- SIM-SAM differences: star formation is still active in SIM galaxies at $z=2$, whereas in SAM galaxies have formed earlier and are already quiescent in cluster cores at that epoch.



Blue fraction

RS Luminous-to-faint ratio



CLUSTERS-IN

CLUSTERS-OUT

GROUPS

FOSSIL GROUPS

SAM

SAM fixed M_v