Galaxies meet GRBs at Cabo de Gata

When : 23-27 September 2013 Where :

Are LGRBs biased tracers of SFR?
Clues from a complete sample of z<1 LGRB hosts

S.D. Vergani (CNRS, Paris Observatory - INAF, Milan Observatory) & many collaborators

Assessing the Bias

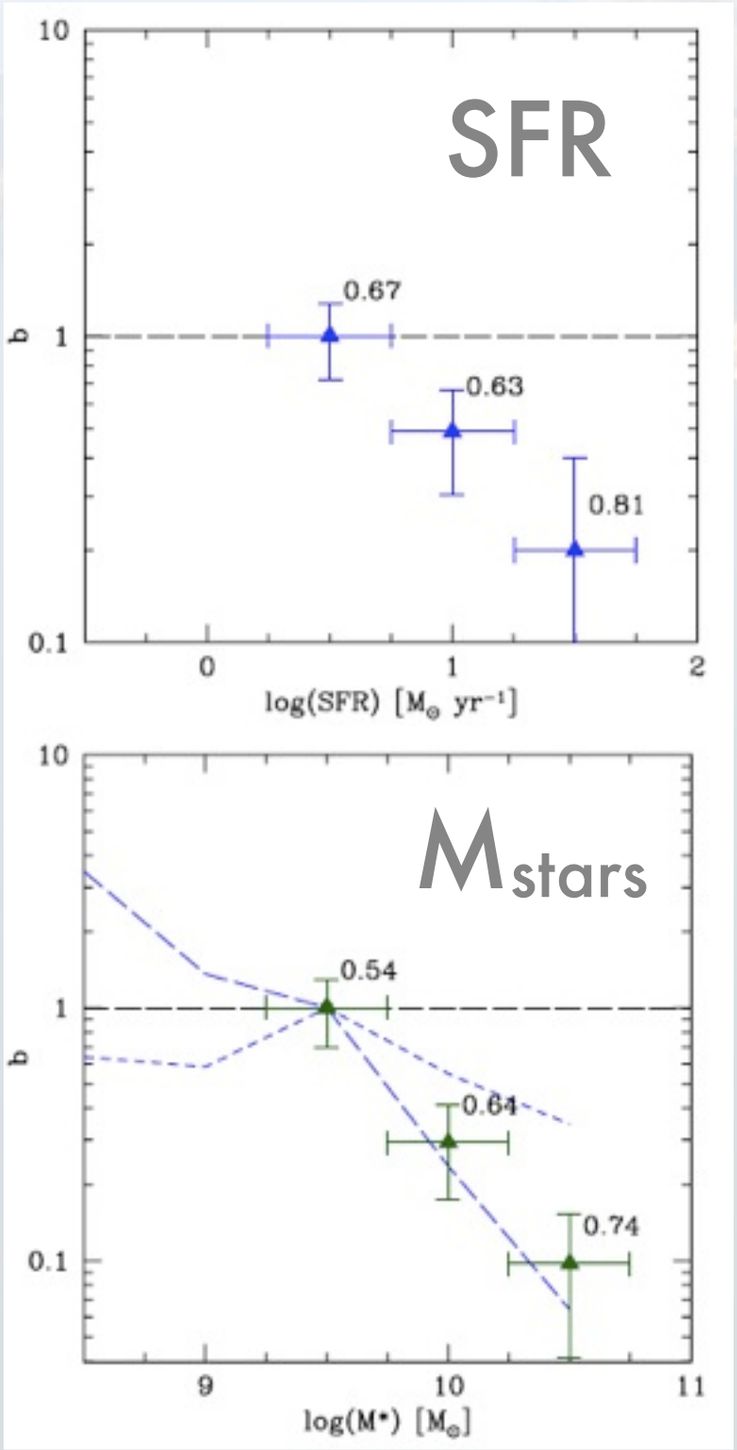
Boissier et al. 2013

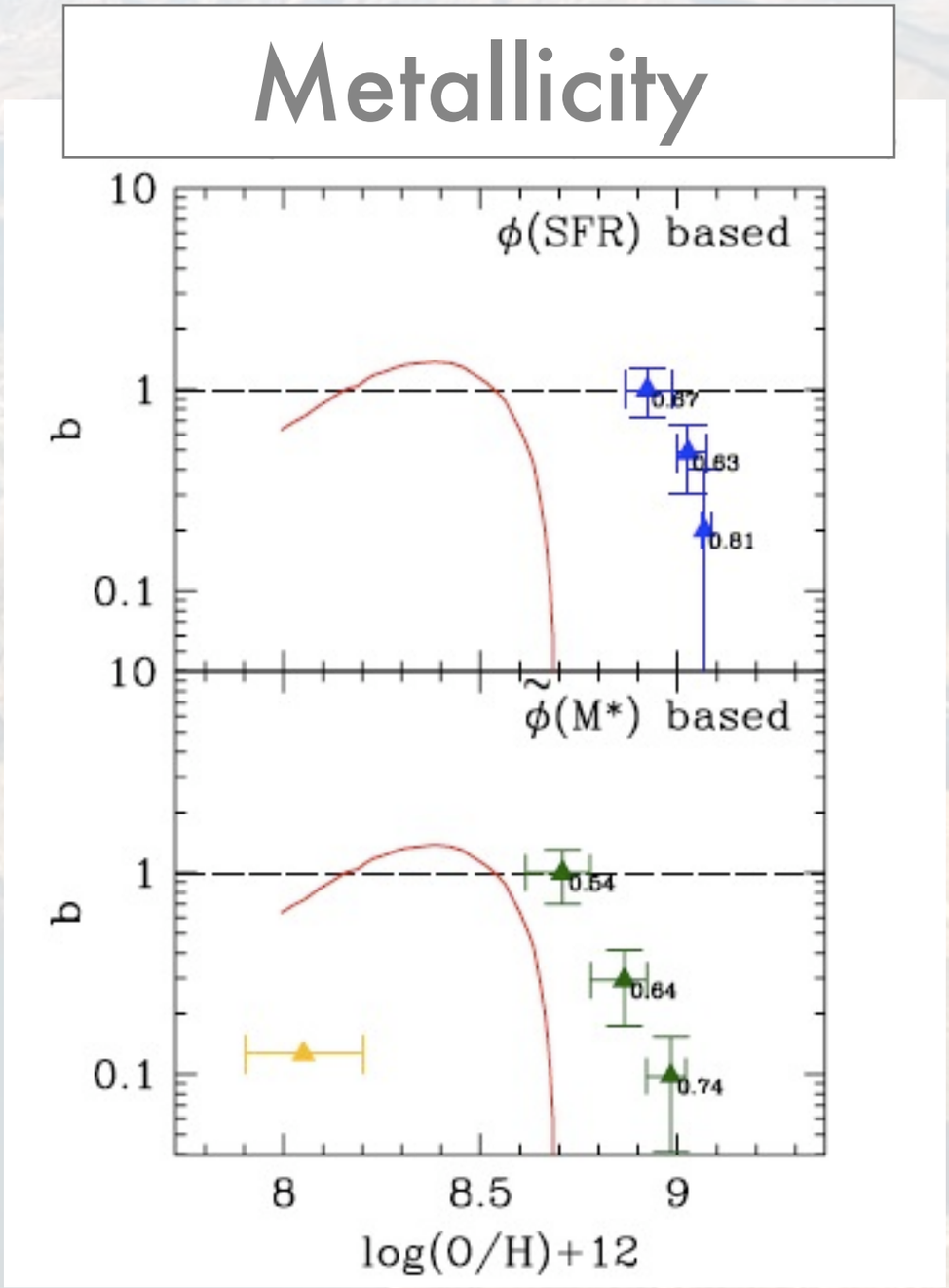
GRBrate = bias x SFR bias = b(z)

- quantify the dipendence with SFR and Stellar Mass by comparison with Star Forming Galaxies (SFG z<1.1; Boissier et al. 2010)
- Connect to a more physical depencence on Metallicity

Assessing the Bias

Boissier et al. 2013





Predictions from the Millenium

Campisi et al. 2009 on

- LGRBs originate from death of massive stars
- putting metallicity constraints on the progenitor

Properties of LGRB hosts
and their distribution

The BAT6 sample

Salvaterra et al. 2012 + others

- Observing condition criteria (see TOUGH)
- cut on the BAT brightness
- 58 LGRBs
- 95% redshift completeness

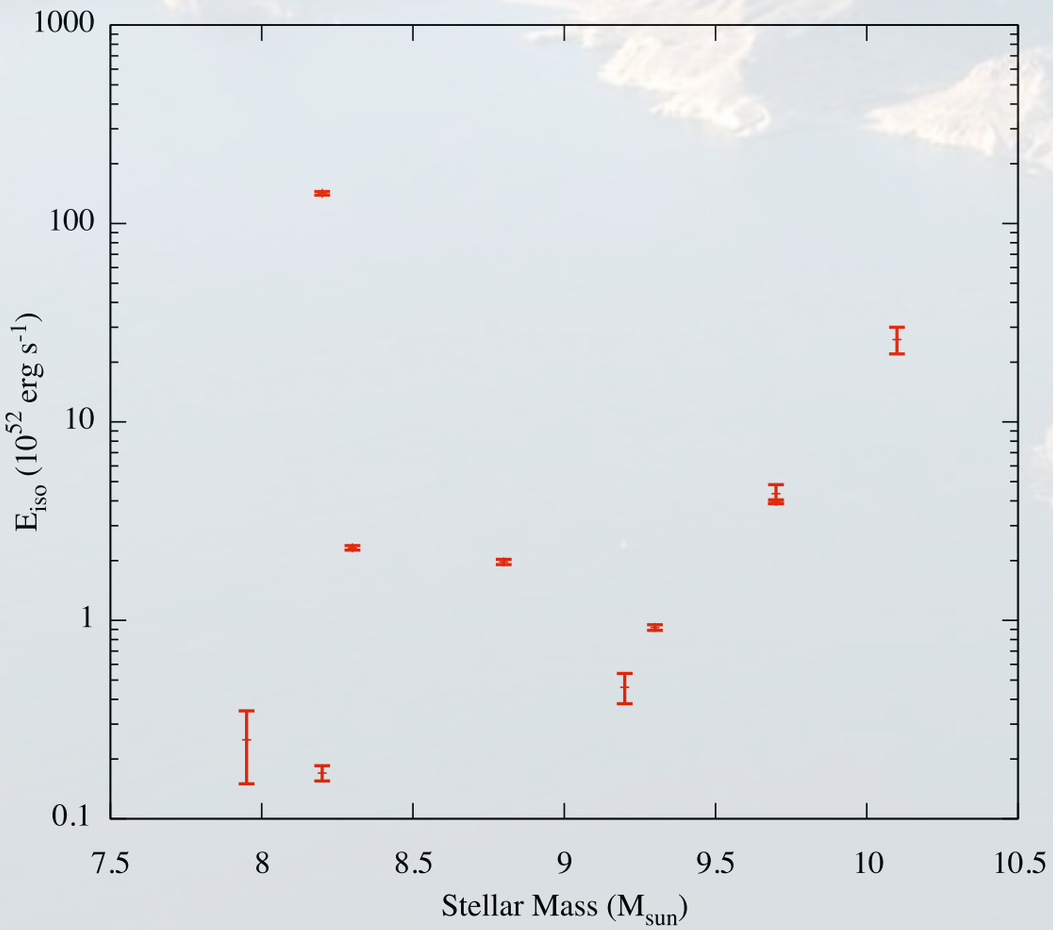
Nava+ 2012; D'avanzo+ 2012; Campana+ 2012; Melandri+ 2012; Covino+2013; Ghirlanda+2013; +++

The z<1 BAT6 hosts

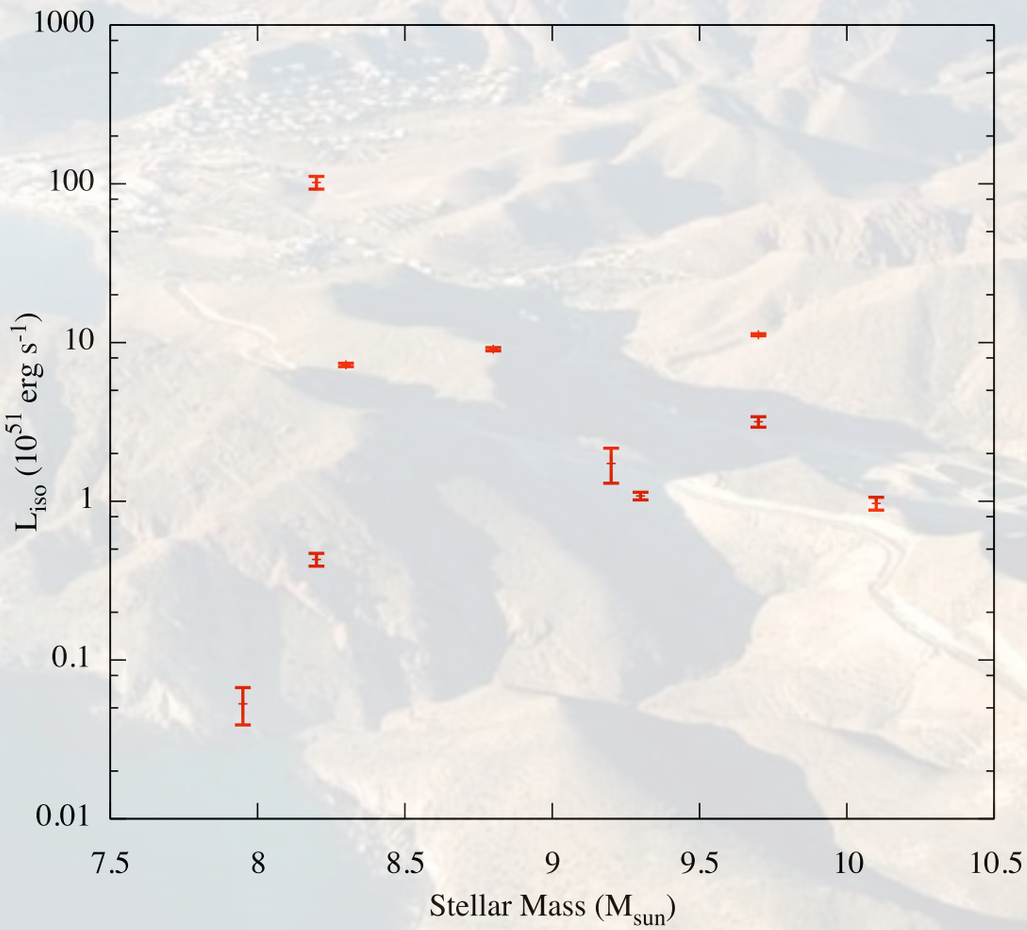
- 14 hosts
- Data in the literature
- SFR, Stellar Masses, M_B
- VLT, GTC, OPTICON + available data
- Metallicity

E_{iso} & L_{iso} vs M_{star}

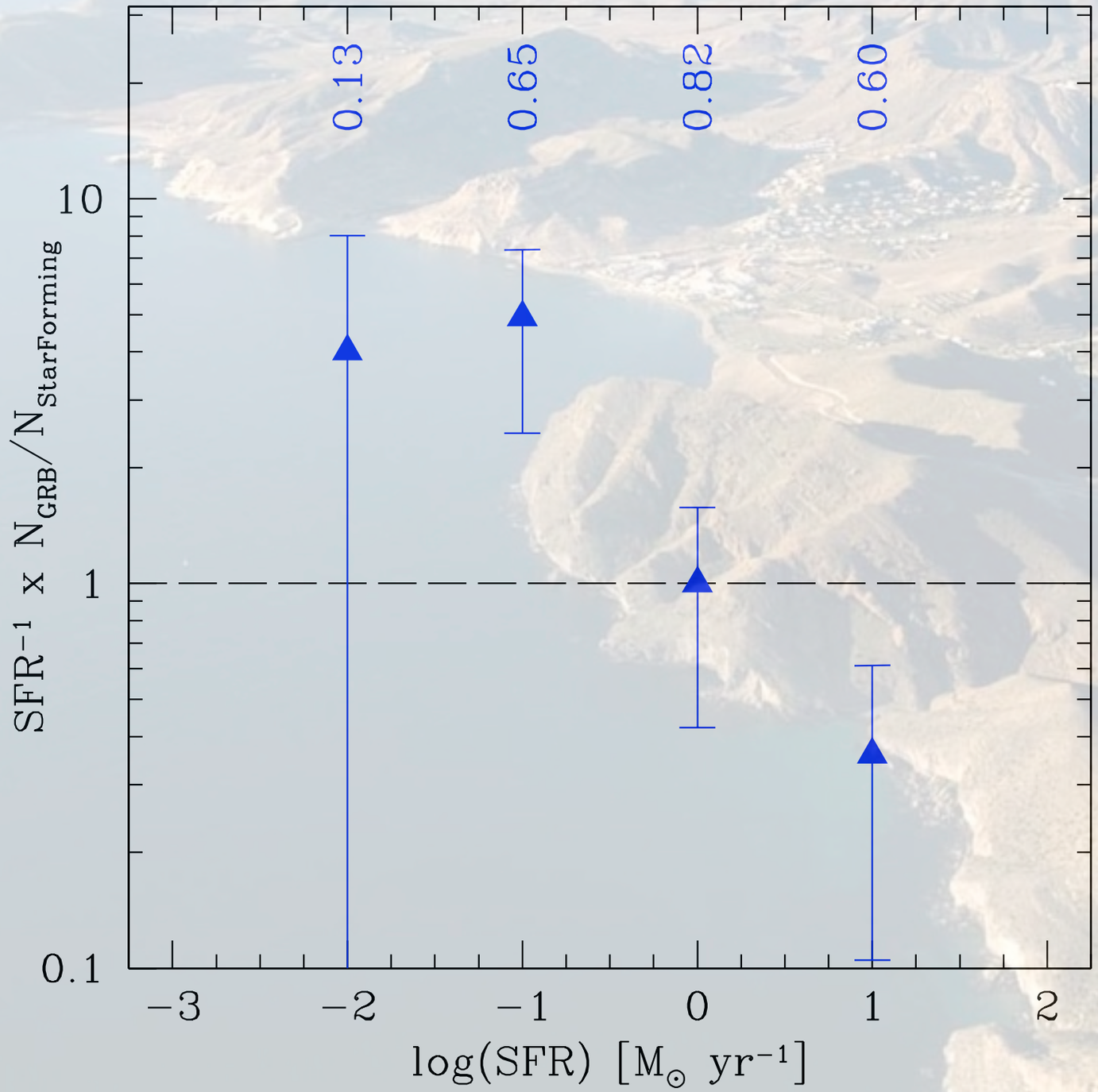
E_{iso} vs M_{stars}



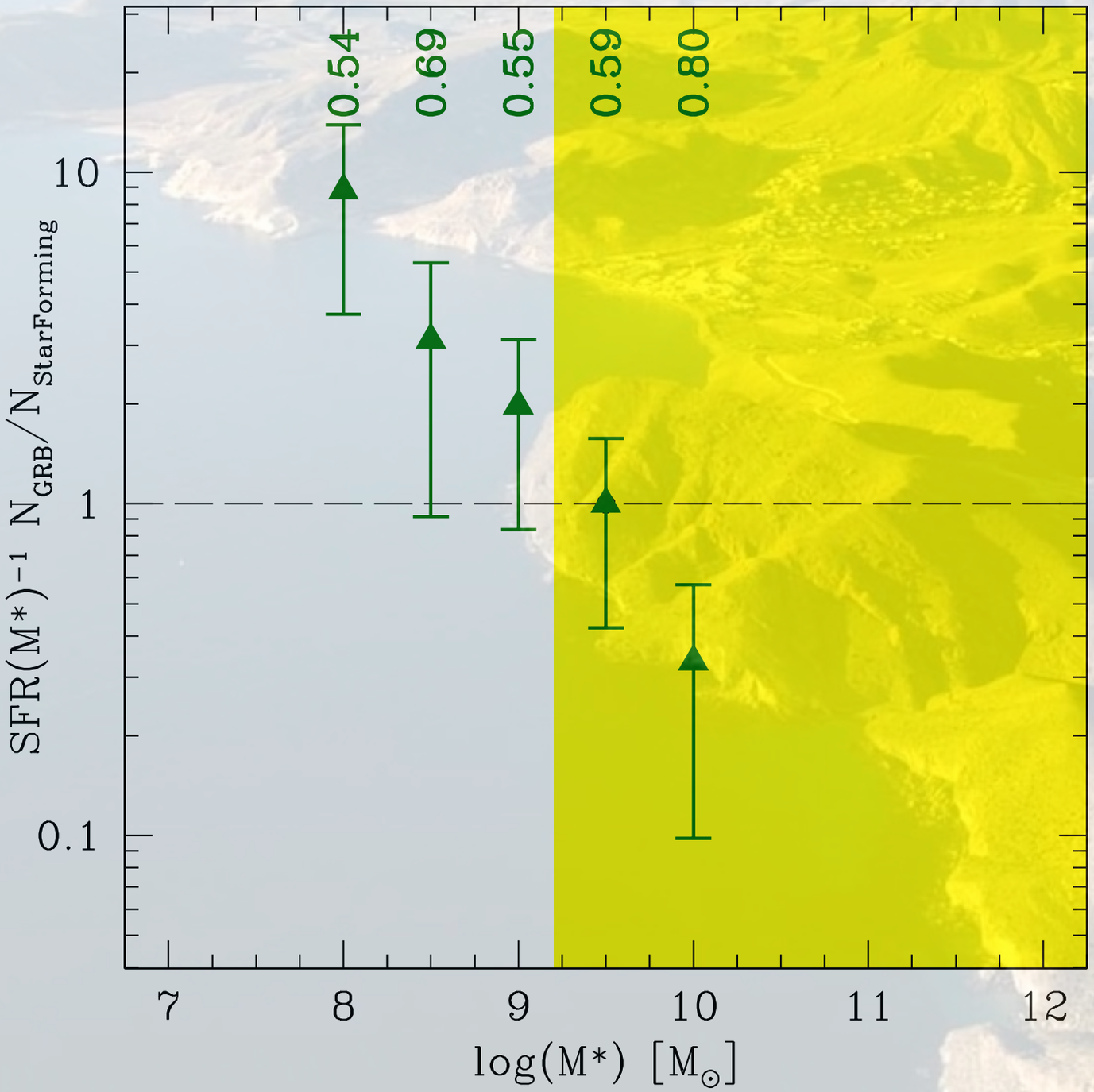
L_{iso} vs M_{stars}



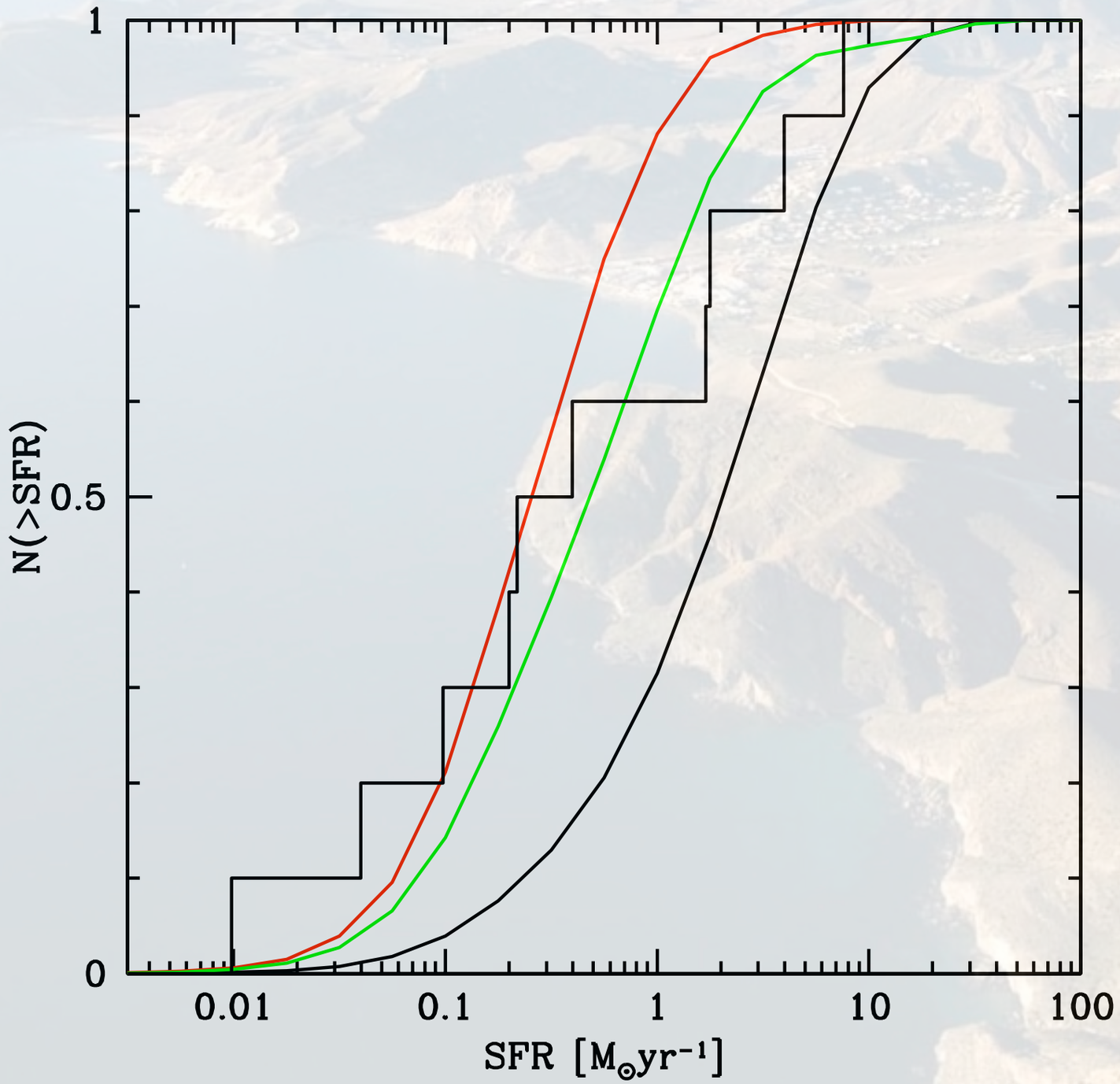
Boissier's bias test



Boissier's bias test



SFR distribution

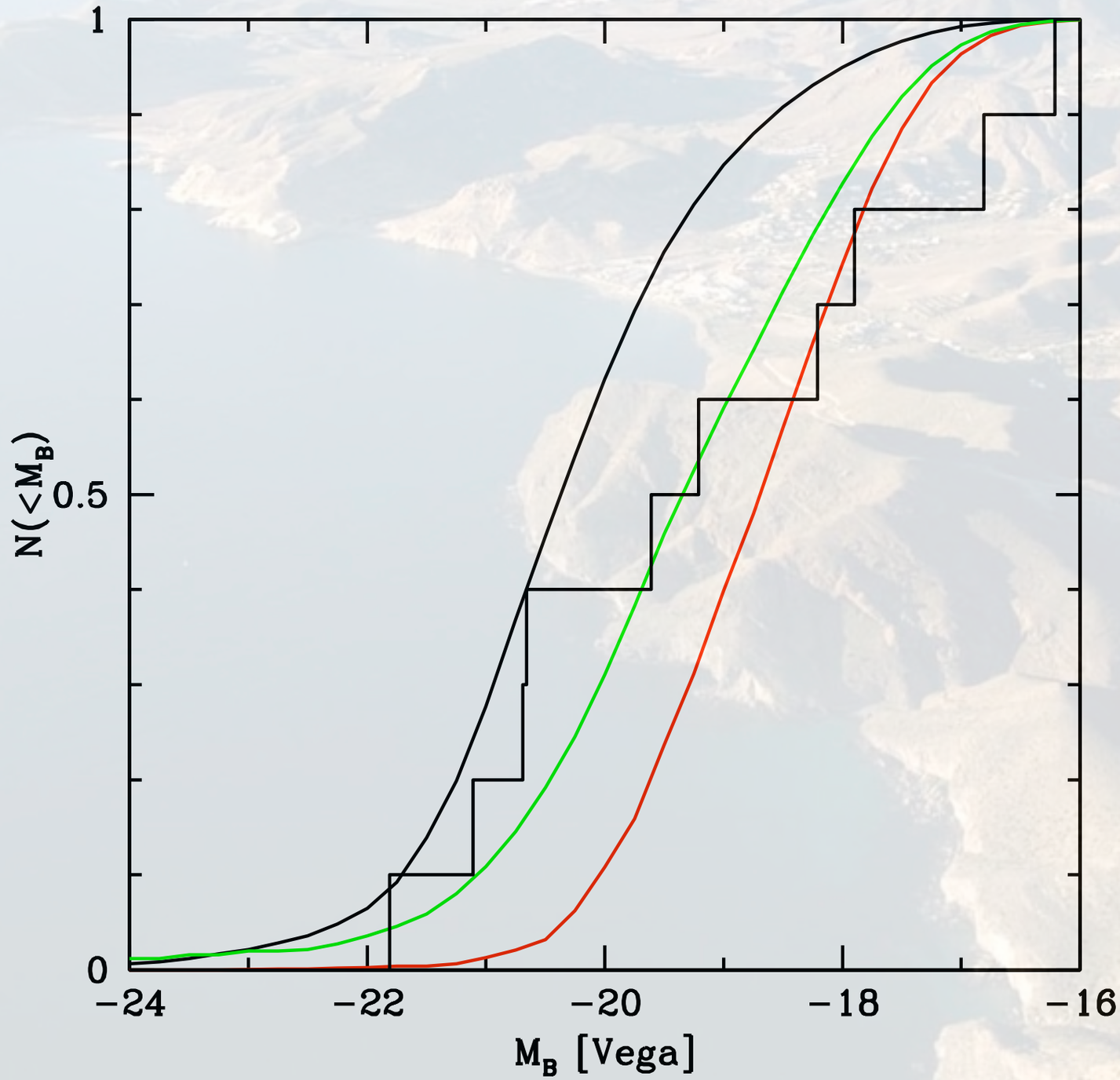


No Z cut

$Z<0.3Z_{sun}$

$Z<0.5Z_{sun}$

M_B distribution

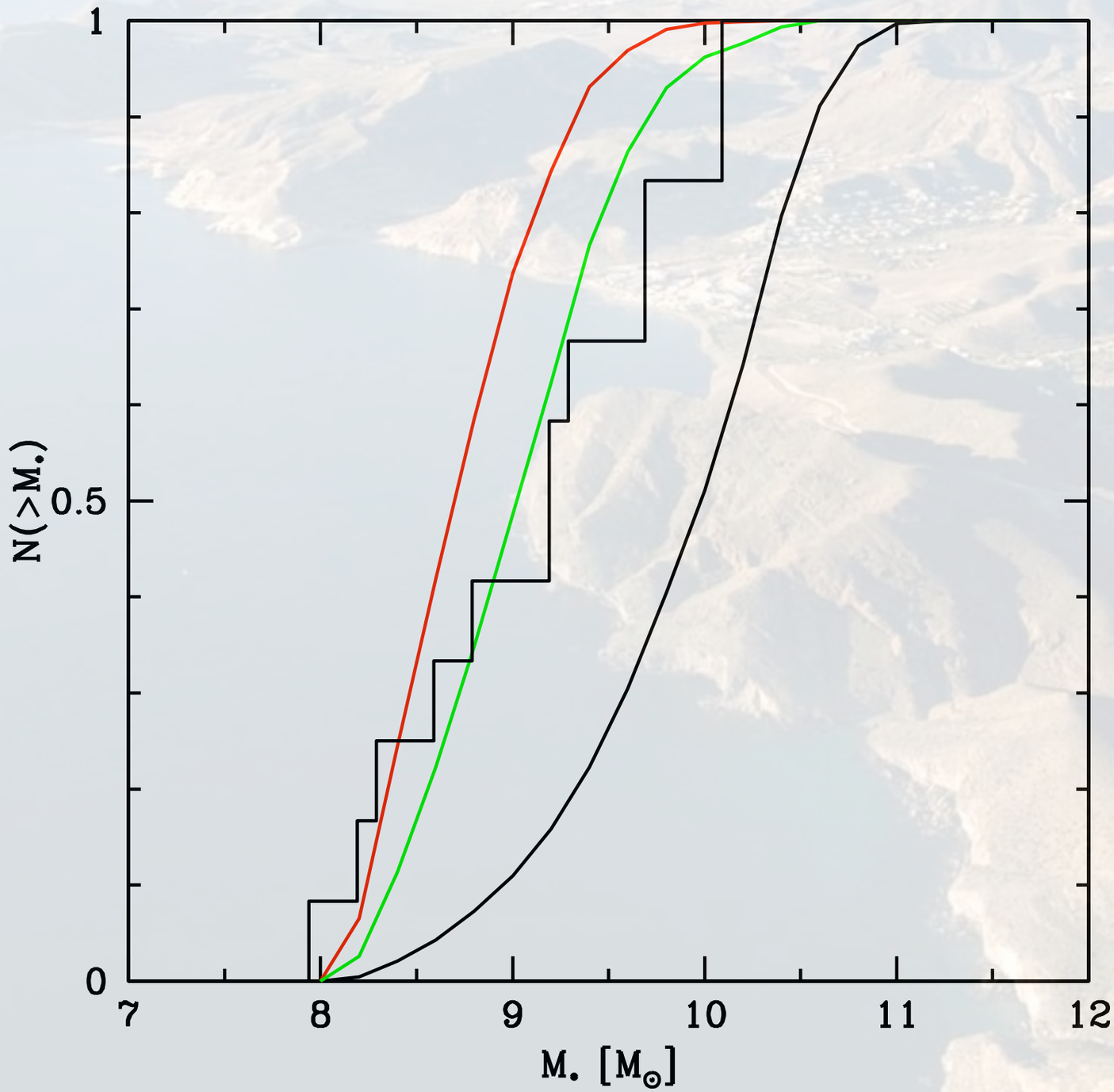


No Z cut

$Z<0.3Z_{sun}$

$Z<0.5Z_{sun}$

Stellar Mass distribution



No Z cut

$Z<0.3Z_{sun}$

$Z<0.5Z_{sun}$

Conclusions

- there is a bias, decreasing with M_{stars} and SFR
- probably linked to the metallicity
- sample metallicity distribution to come
- extending the study to z=1.5

Cabo de Gata Natural Par

THANKS!