

Star cluster parameters from integrated photometry: The case of WFC3@HST



Poster
presentation

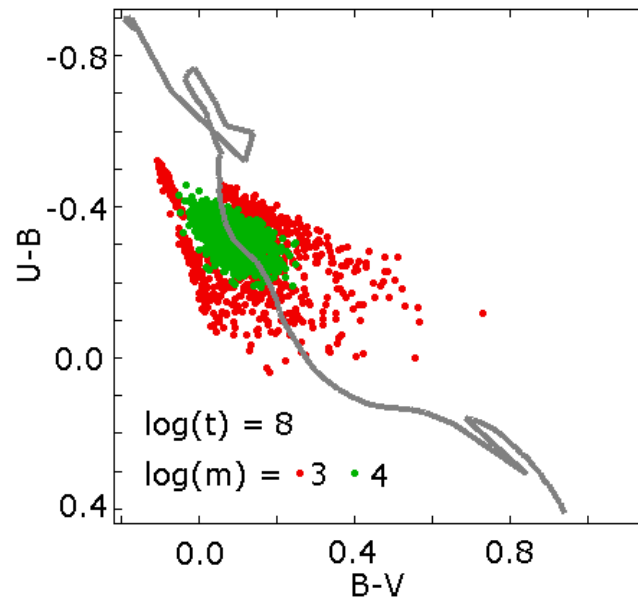
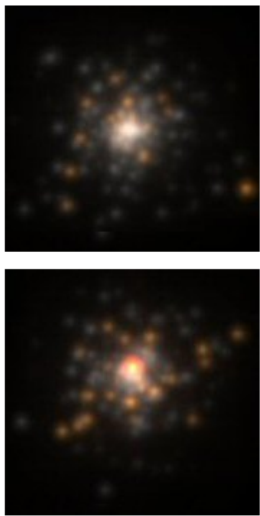
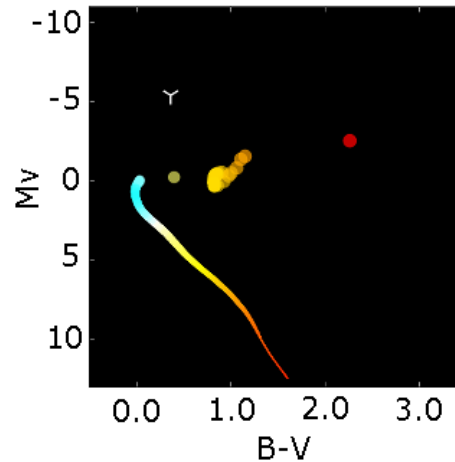
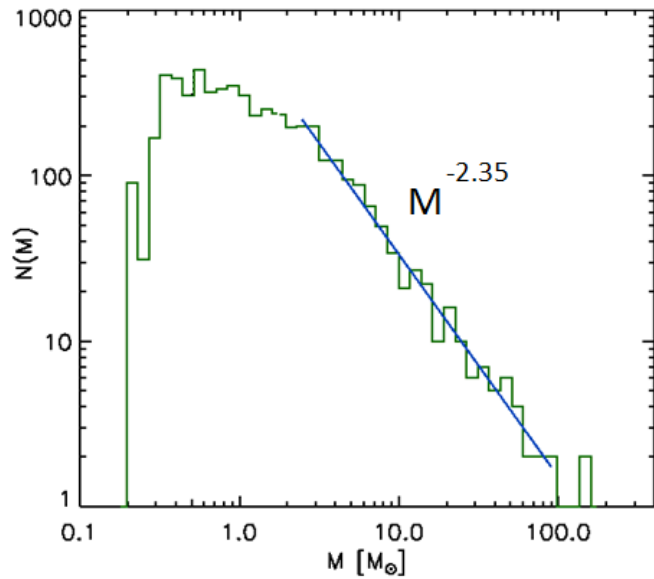
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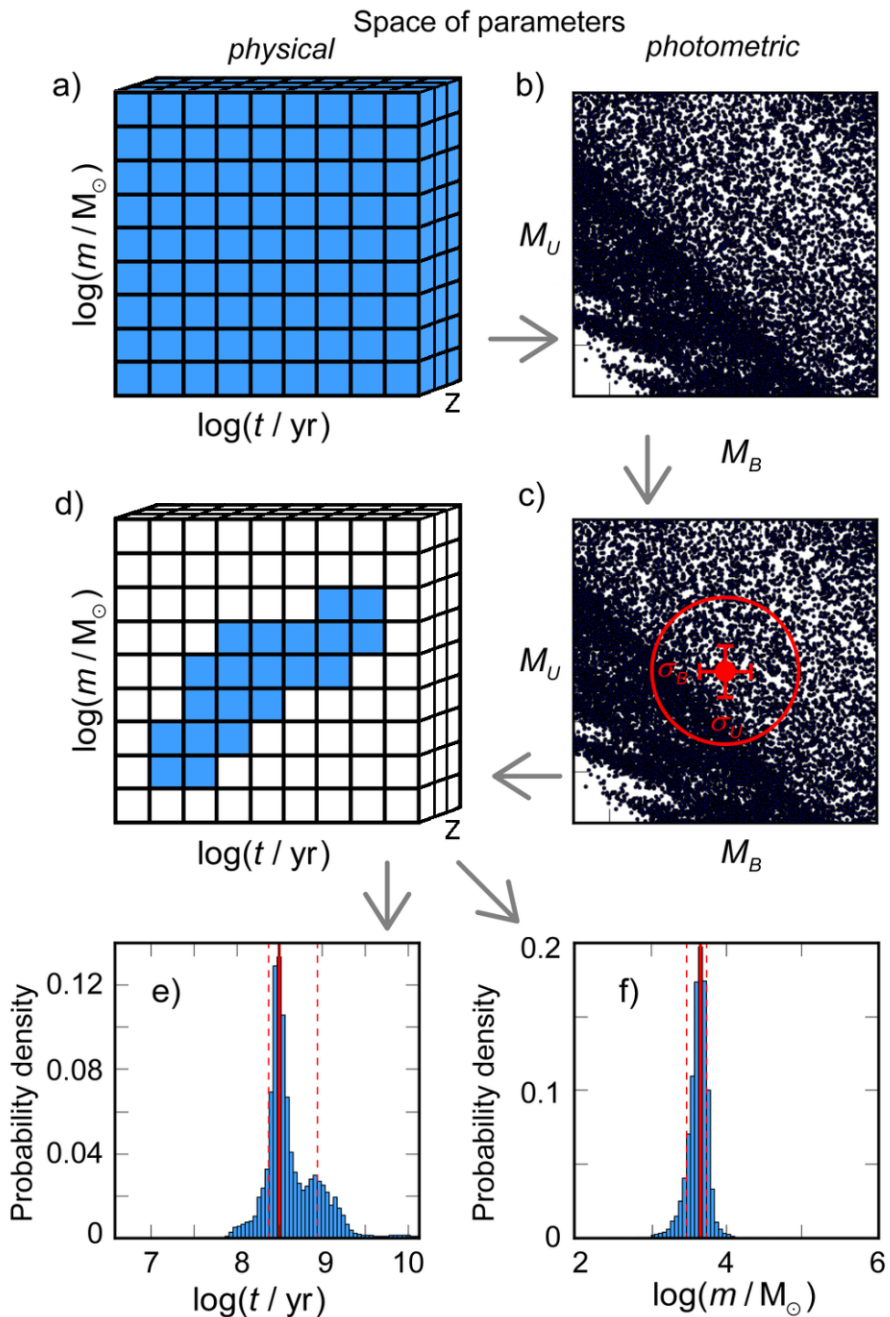
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The stochasticity problem



- Earlier, SSP models (infinite mass)
- Low-mass clusters: the sampling of IMF can create a different number of massive stars (Santos & Frogel 1997)
- Integrated colors are dispersed for clusters with the same parameters! (Fouesneau et al. 2010; Popescu et al. 2010)



The method

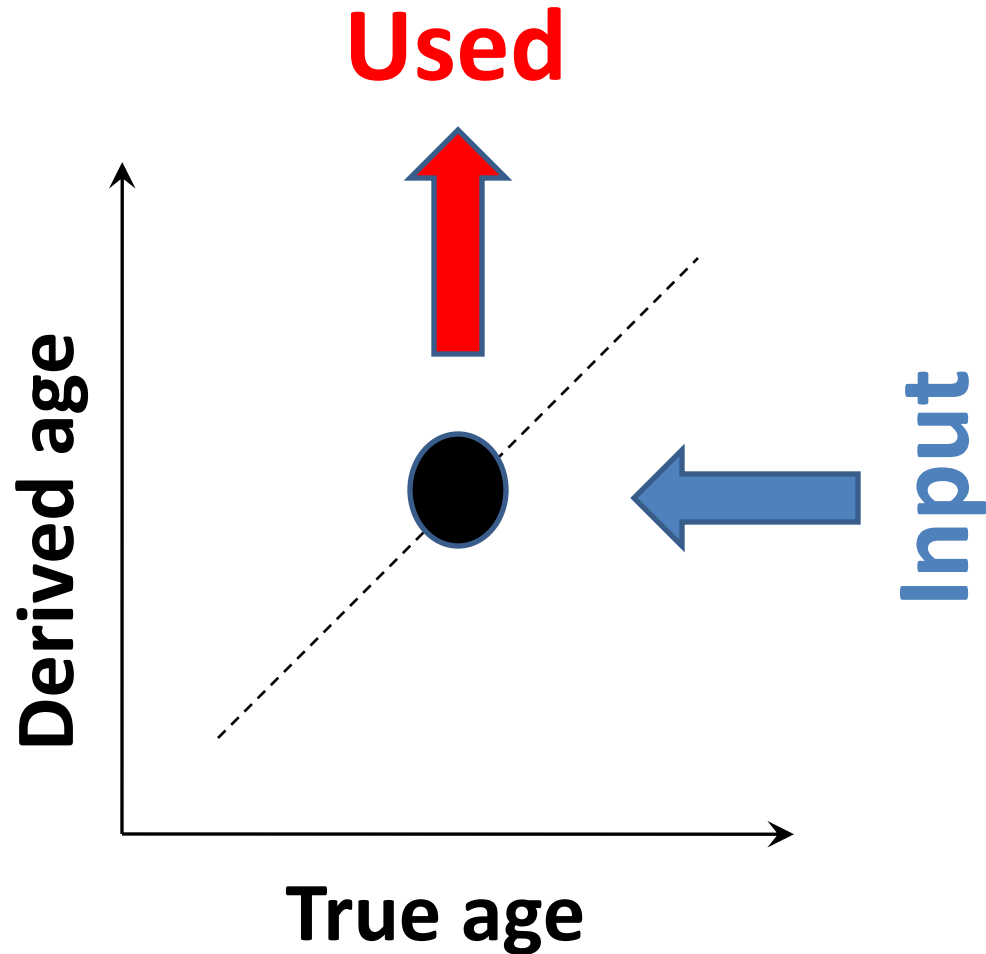
- Stochasticity: build a grid of age-mass-extinction-metallicity (1000 models per node) using Padova (Girardi et al. 2010) stellar models
- Select models located in the 3-sigma area around observation
- Derived parameters from the maxima of distributions
- Use 6 WFC3 Filters: F275W, F336W, F475W, F814W, F110W and F160W

Test on artificial clusters: age

$Z=0.019$

$Z=0.005$

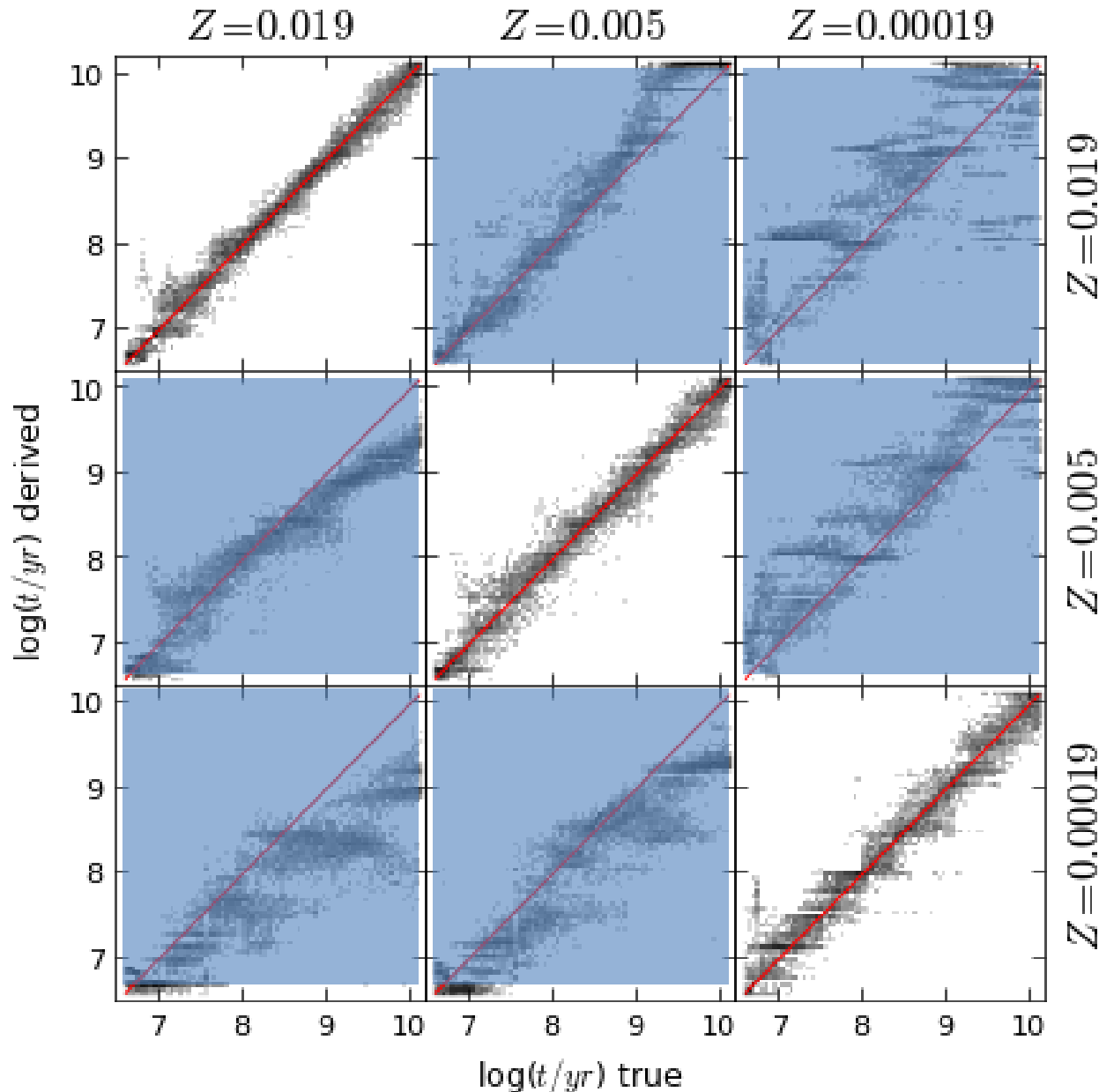
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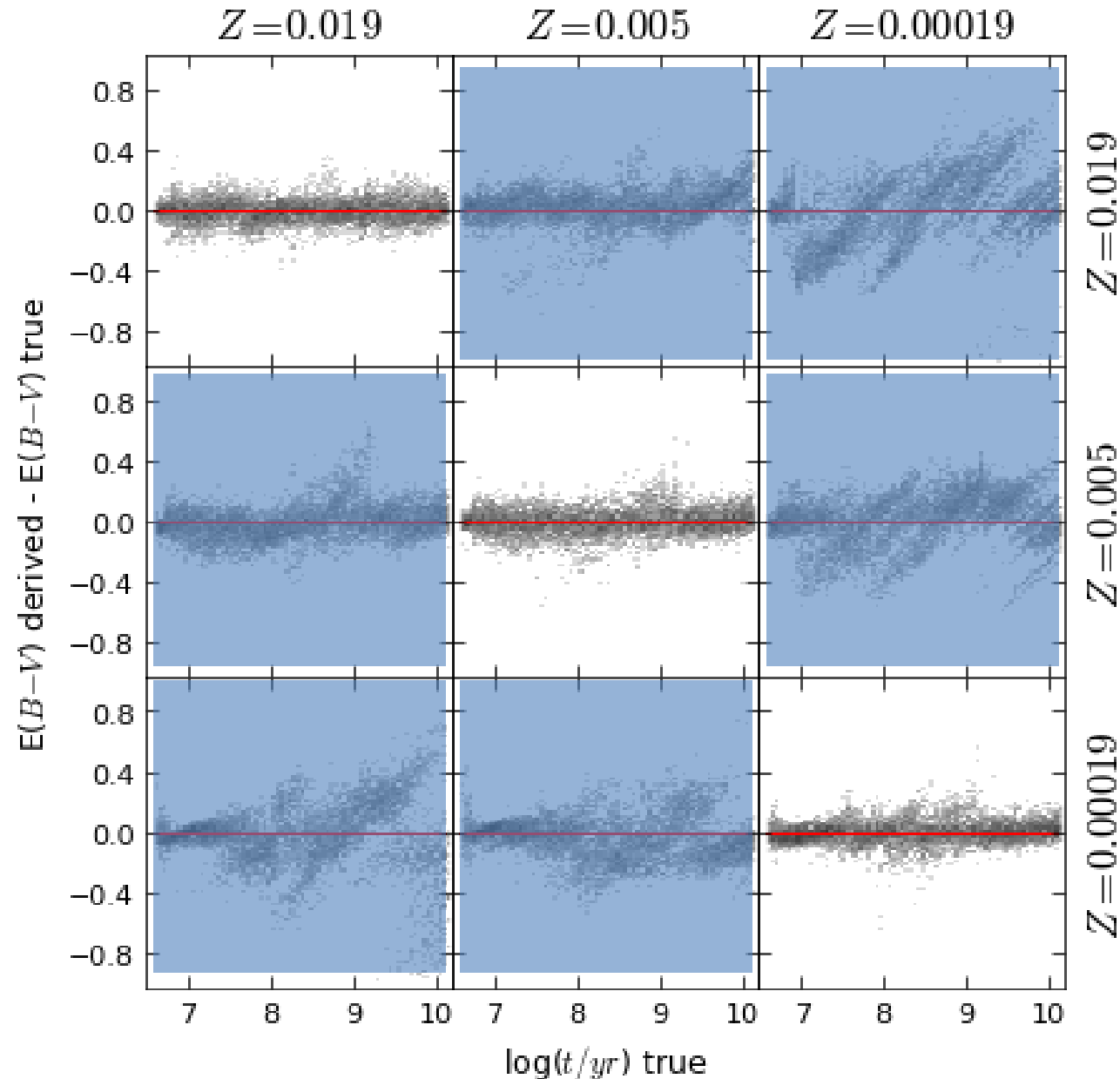
- $\log(m/M_{\odot}) = 4$
- 3 different input Z vs model grid of 3 different Z
- Gaussian photometric errors of $\sigma = 0.05$ mag
- Extinction in the range $E(B-V) = [0, 1]$

Test on artificial clusters: age



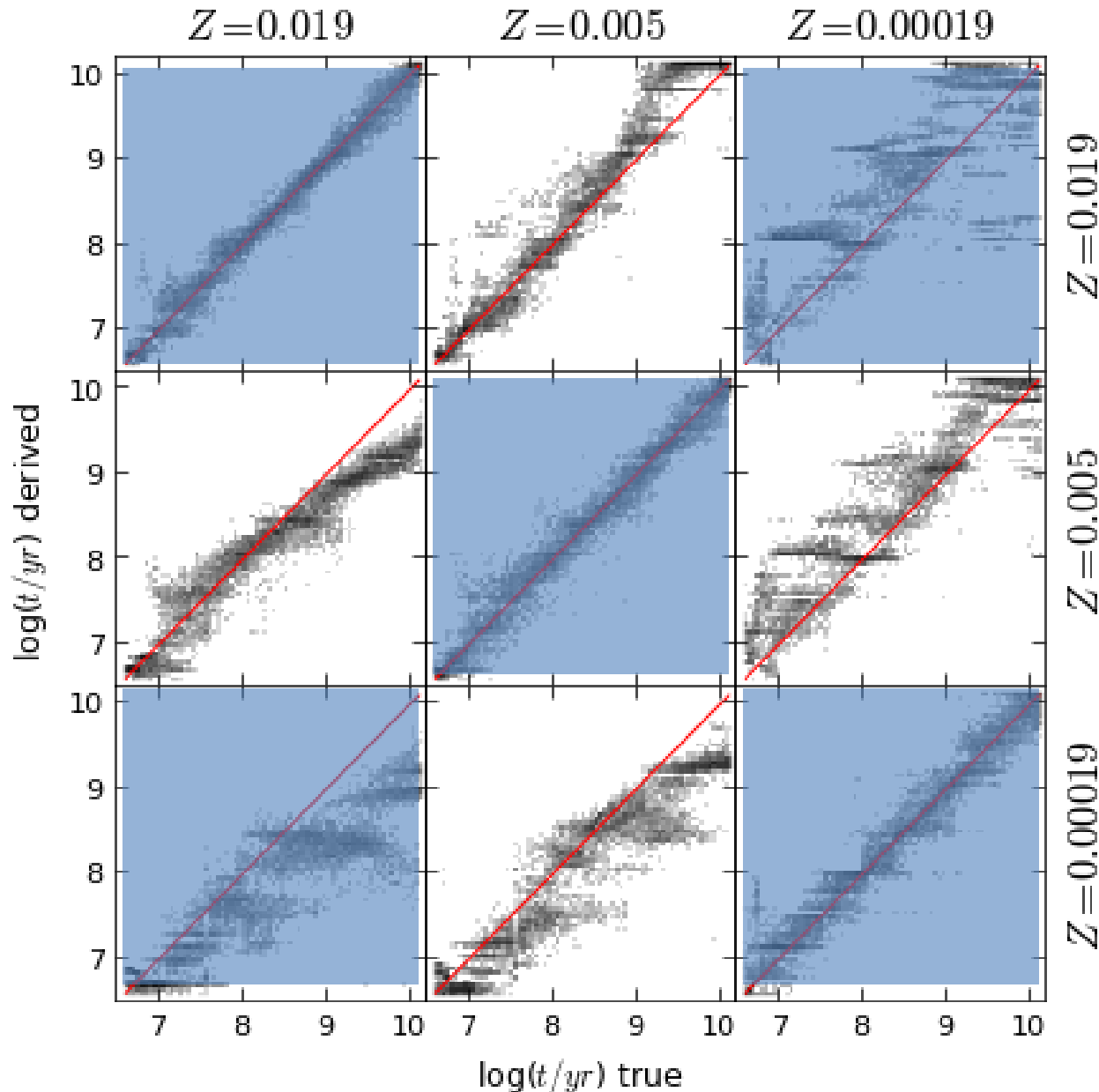
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Test on artificial clusters: extinction



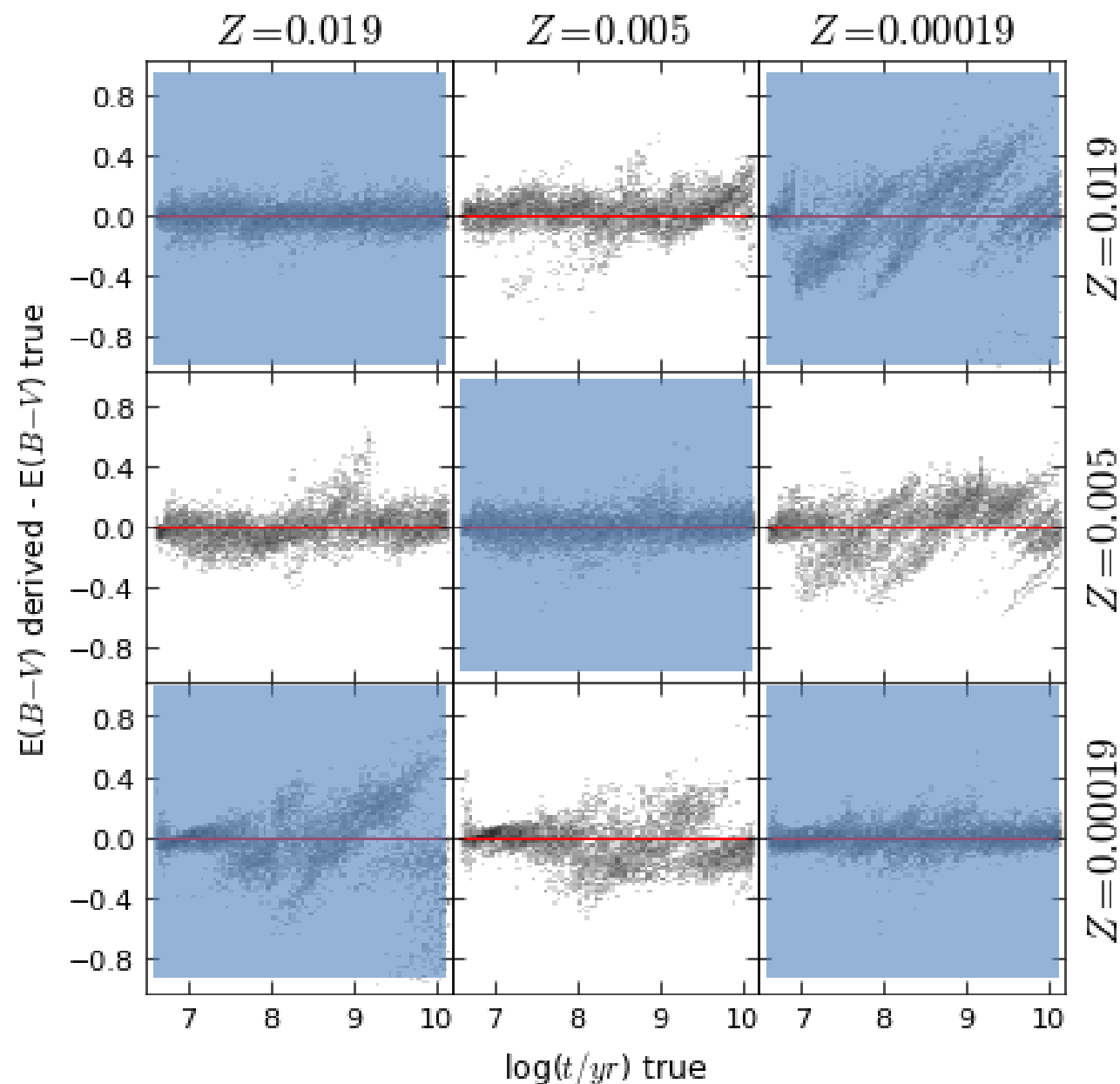
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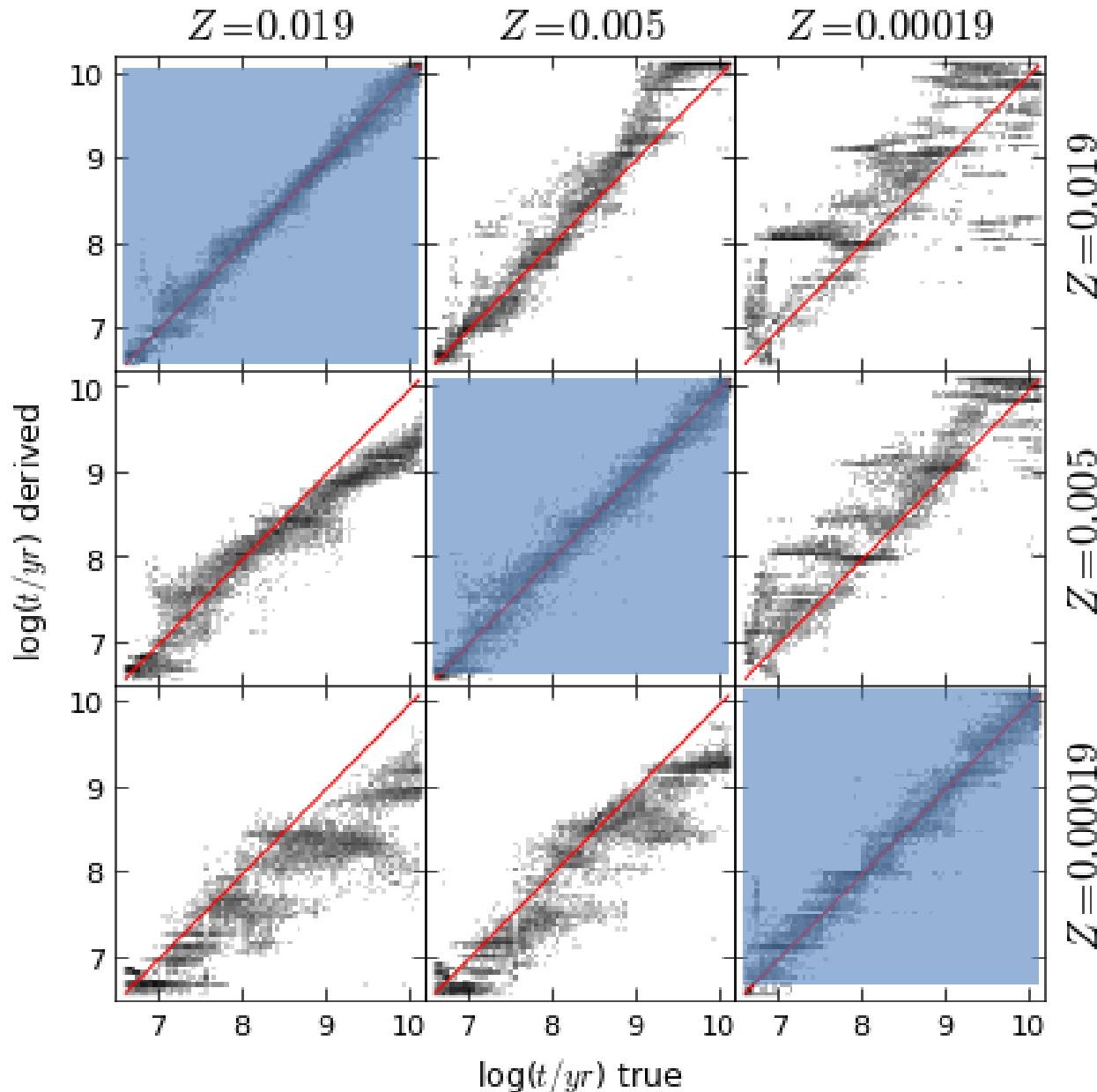
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Conclusions

The errors of derived parameters of unresolved star clusters were quantified without a priori knowledge of extinction and metallicity in case of the WFC3 photometric system of HST

This is an extension of the study presented by de Meulenaer et al. (2013)