Galaxy Zoo: Star Formation Histories in the COSMOS Survey

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ABSTRACT

Key words: keyword1 – keyword2 – keyword3

1 INTRODUCTION

2 METHODS

Starpy from becky's paper Smethurst et al. (2015). Becky's group environment paper Smethurst et al. (2017). UltraVista catalogue paper Muzzin et al. (2013)

3 DATA

3.1 Multi-wavelength data

This study is based on a K_s-selected catalog of the COSMOS/UltraVISTA field from Muzzin et al. (2013). The catalog contains PSF-matched photometry in 30 photometric bands covering the wavelength range 0.15μm $\rightarrow$ 24μm and includes the available *GALEX* (Martin et al. 2005), CFHT/Subaru (Capak et al. 2007), UltraVISTA (McCracken et al. 2012), S-COSMOS (Sanders et al. 2007), and zCOSMOS (Lilly et al. 2009) datasets.

3.2 Environment data

Environment data from Darvish et al. (2015).

- Method used is Weighted Voronoi Tessellation
- Quote from darvish: Unlike the nearest neighbor, Voronoi tessellation is scale-independent and is able to span a wide range of physical lengths. Also, it does not make any assumptions about the geometry and morphology of the structures in the density field. This characteristic makes it superior to adaptive kernel and nearest neighbor methods.
- Quote from Darvish: However, this comes at the expense of a computationally expensive process by making several Monte-Carlo samples. Apart from its computational time, it is a robust estimator.
- formula:

$$\Sigma(r_i) = \frac{1}{A_i} \tag{1}$$

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3.3 Galaxy Zoo Hubble Morphological classifications

Galaxy zoo hubble data paper Willett et al. (2017)

4 MODEL

$$\mathrm{SFR}(t) = \begin{cases} \mathrm{SFR}_0(t_q) & t \leq t_q \\ \mathrm{SFR}_0(t_q)\exp\left[-\frac{(t-t_q)}{\tau}\right] & t > t_q \end{cases} \tag{2}$$

5 PROBALISTIC FITTING

$$P(\theta_k) = \begin{cases} 1 & 0 \leq t_q \text{ [Gyr]} \leq 13.8 \text{ and } 0 \leq \tau \text{ [Gyr]} \leq 4 \\ 0 & \text{otherwise} \end{cases} \tag{3}$$

6 CONCLUSIONS

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