



The UV side of BOSS galaxies.

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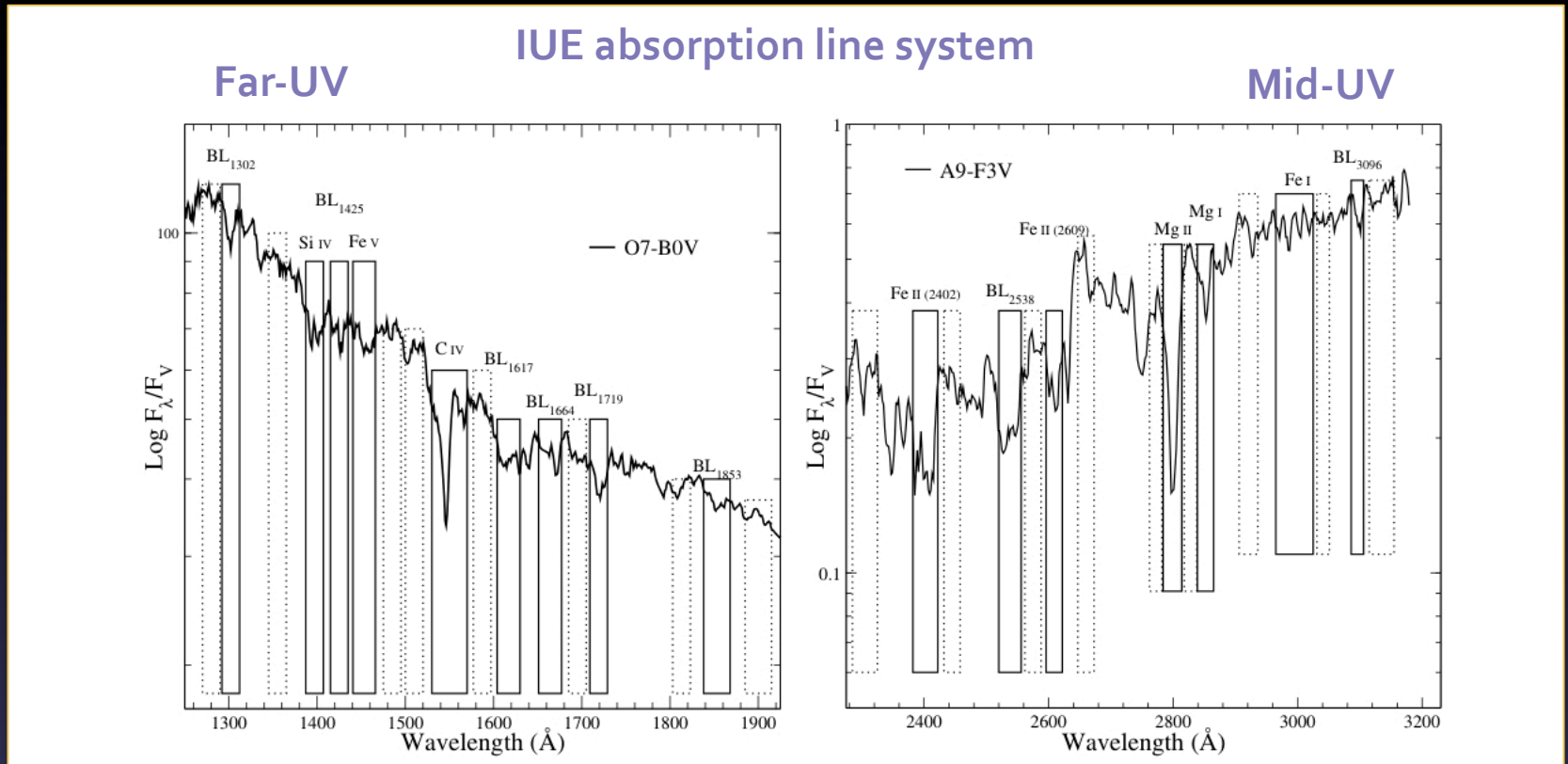
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Overview

- Absorption indices in the UV
- Models
- First application to data: SDSS III / BOSS

UV Absorption Indices

Hot component of galaxy stellar populations traced in far and mid-UV ($\sim 1200\text{-}3200\text{\AA}$)



Models

Maraston et al. 09 model synthetic line indices for stellar populations in the UV.

* 19 indices, covering far and mid-UV

* Ages $1\text{Myr} \leq t \leq 1\text{Gyr}$, metallicities $(2, 1, 1/2, 1/20)Z_{\odot}$

Empirical model

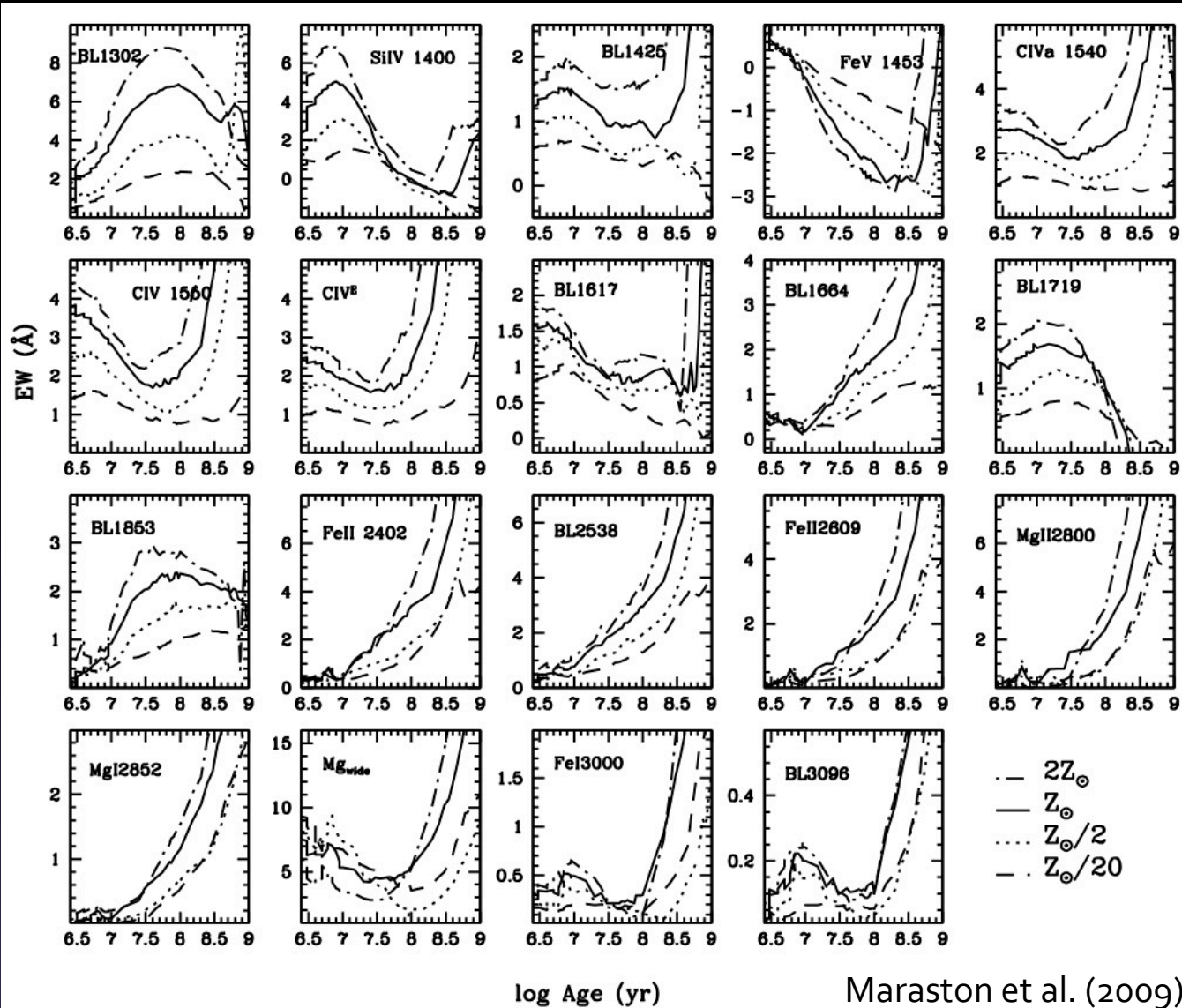
- Low-res (6\AA) IUE observations
- Fitting functions, stellar parameters (T_{eff} , $\log g$, $[Z/H]$)

Theoretical model

- Direct integration on synthetic SEDs (Maraston et al. 2009) of stellar population models based on high resolution theoretical stellar spectra (Rodriguez-Merino et al. 2005)

Effect of Age and Metallicity

All indices evolve strongly with age



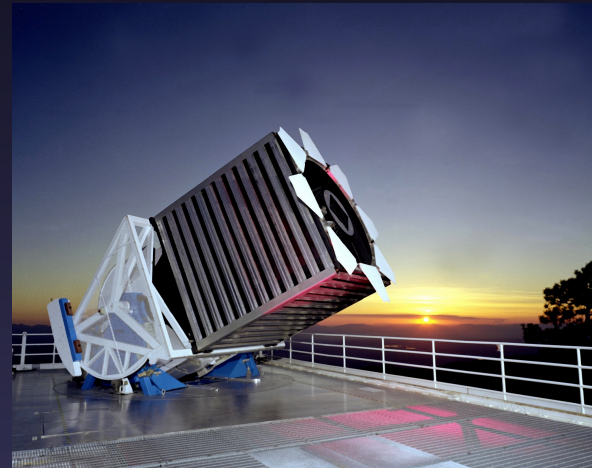
SDSS-III/BOSS

Baryon Oscillator Spectroscopic Survey (BOSS)/SDSS-III

- For constraining cosmology with BAO
- Excellent spectroscopic and photometric galaxy data for 1.3 million luminous, massive galaxies out to $z \sim 0.7$
- 10,000 sq. deg. 2.4 \AA resolution spectra, **3700-10,000 \AA**
- **Emission lines above 3200 \AA removed using modified version of GANDALF**

Working sample: $z \sim 0.63$

- **131,741 galaxies**

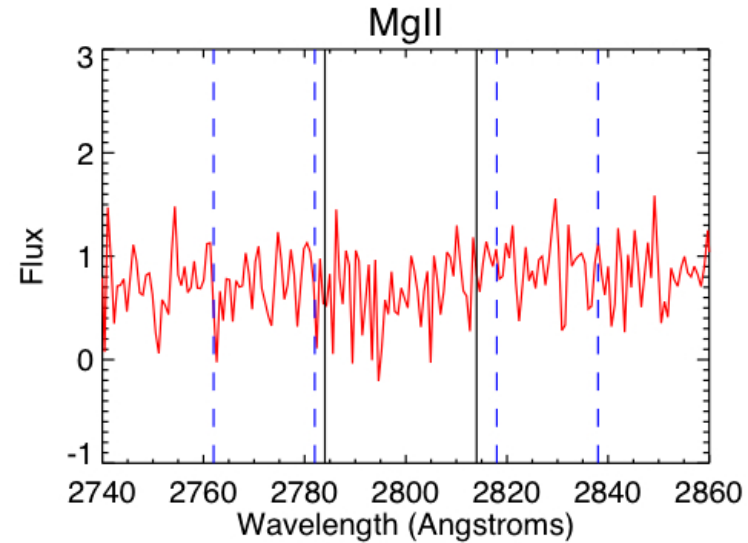


SNR reduced in UV

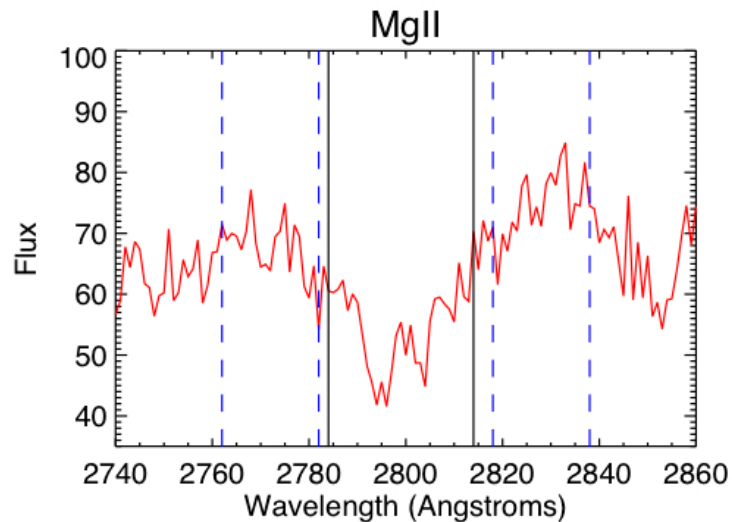
- Naturally reduced in massive galaxies at low- z
- BOSS observations not that deep

Stacking Spectra

- Colour grid ($r-i$ vs. $g-r$)
- Minimum SNR = 30
- 364 stacks produced

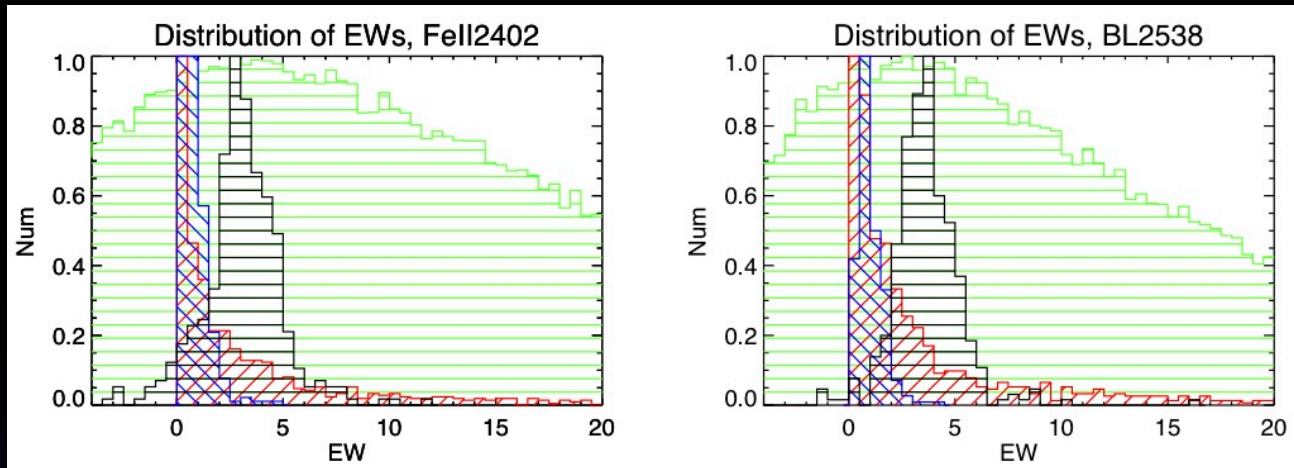


Single: $z = 0.69$ SNR = 11.72



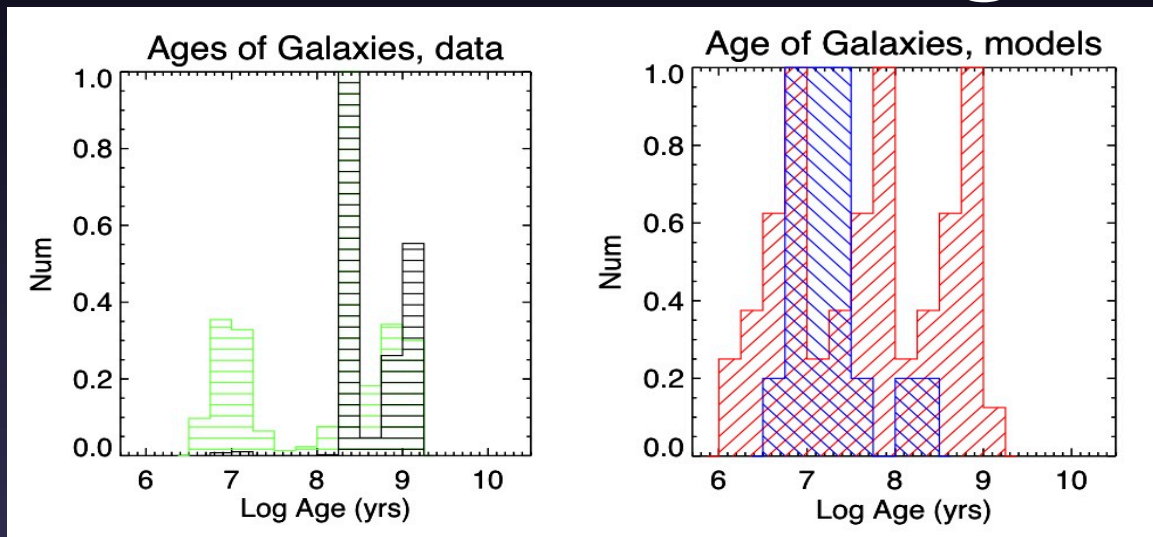
Stack : $\langle z \rangle = 0.68$ SNR = 231.96

Distribution of EWs



BOSS sample
Stacked spectra
Theoretical model
Empirical model

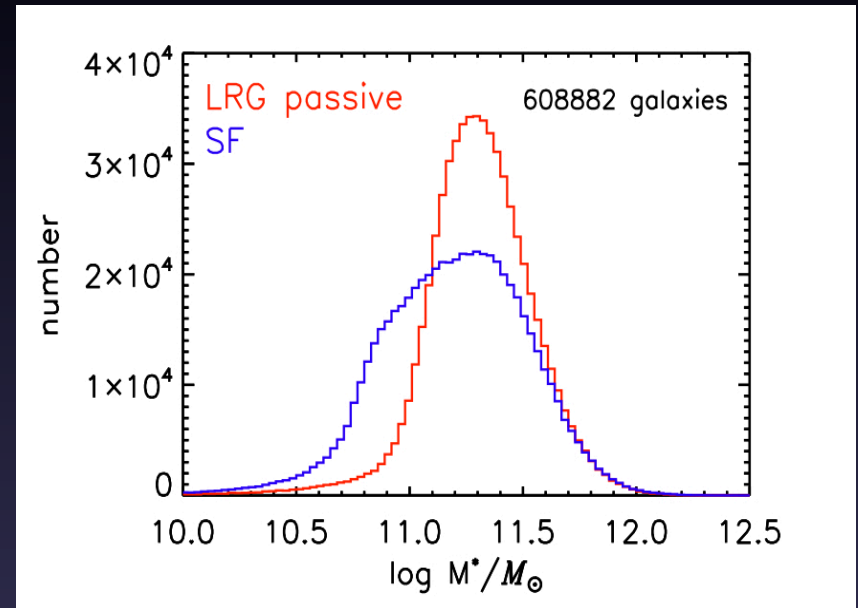
Distribution of Ages

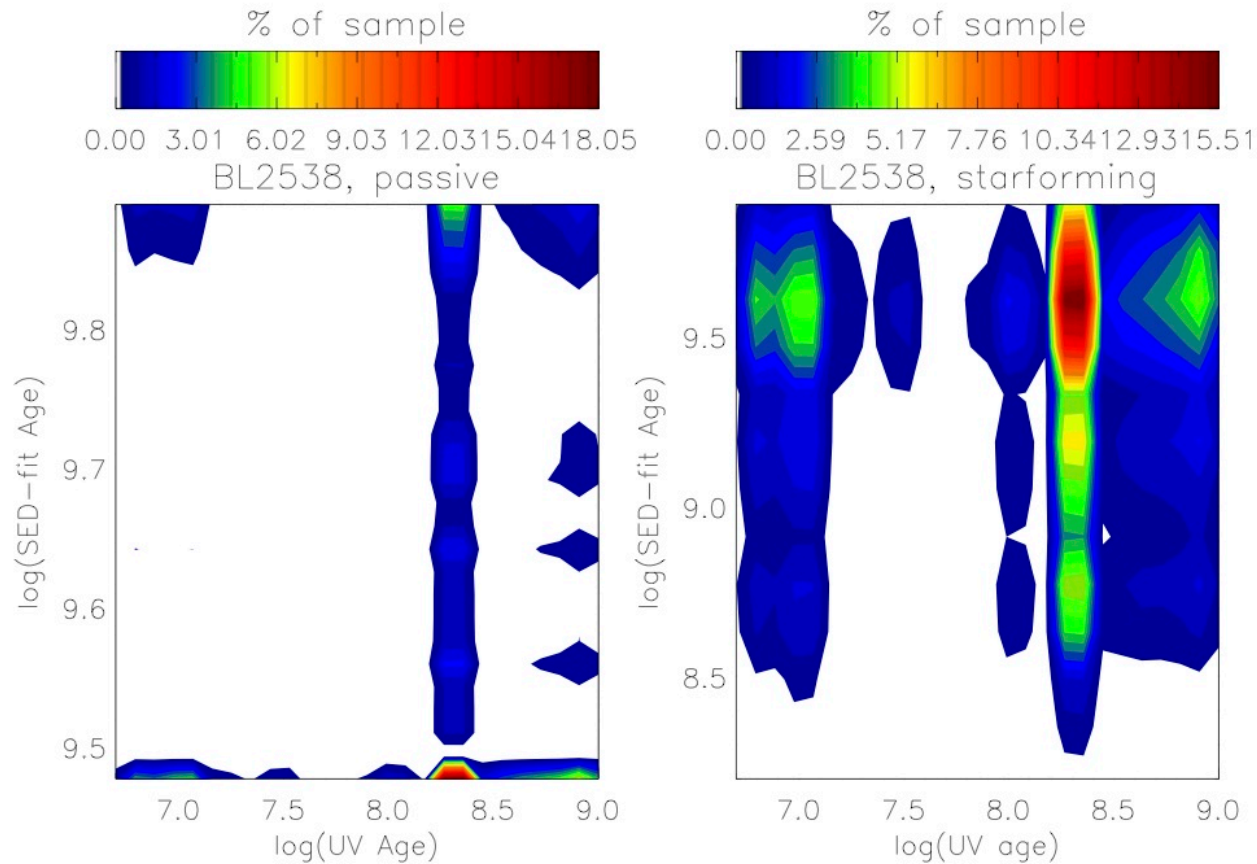


Comparing UV and SED based properties

Ages from Broadband SED fit from published BOSS analysis (Maraston et al. 2013; Thomas et al. 2013)

- Two templates based on Maraston 2005 and Maraston et al. 2009 models, for two IMFs
 - One is **purely passive**, used for galaxies with $g-i \geq 2.35$
 - One **allows for new stars to form**, galaxies with $g-i < 2.35$

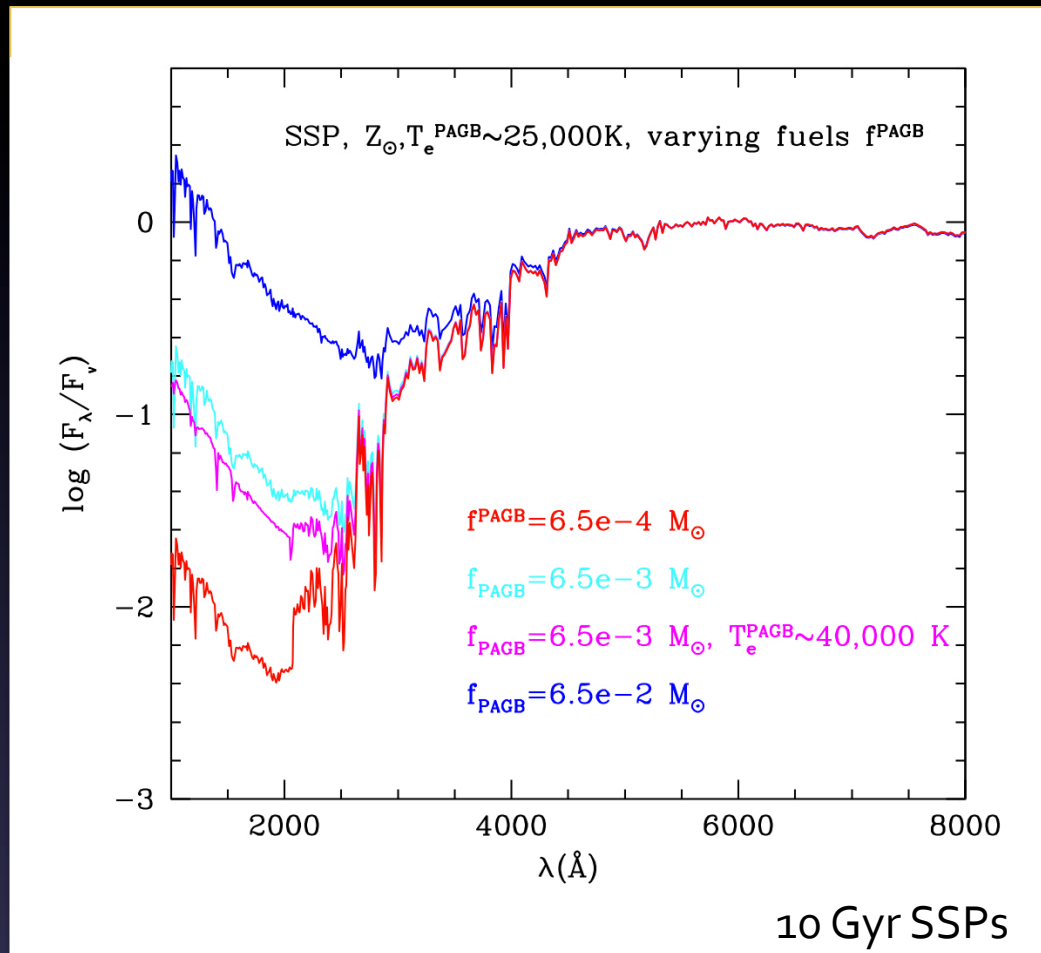




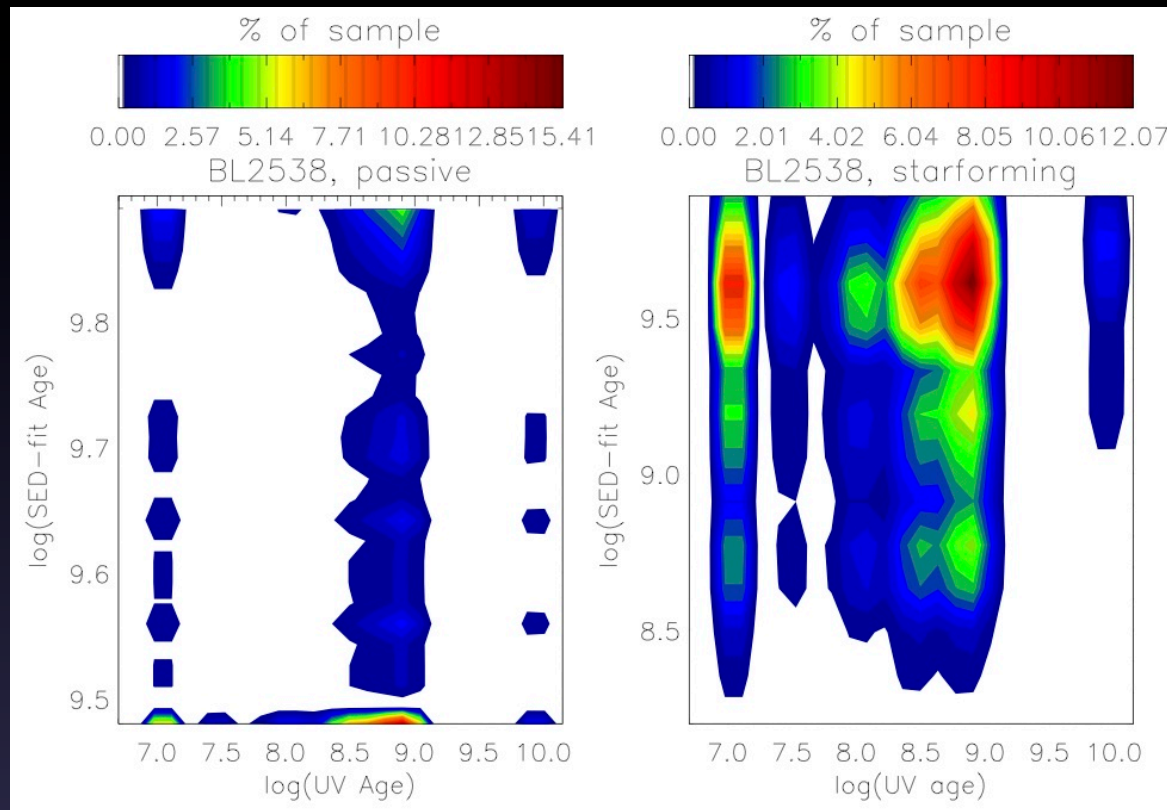
Excellent qualitative correspondence between
 'passivity' of a galaxy and lack of young UV ages

Models for UV-bright Old stars

Preliminary Results! 3 – 14 Gyr population models with a P-AGB hot component, with fuel calibrated UV-upturn (Maraston & Thomas 2000; Greggio & Renzini 1990)



Preliminary Results!



Conclusions

- First application of modelling of UV indices to massive galaxies at $z \sim 0.68$
- Promising results: most indices well resolved & sensible ages and metallicities
- Excellent correspondence with starformation histories and properties from broadband SED fits
- Clues on the UV upturn of massive galaxies at high z