Spectral fitting for DESI BGS

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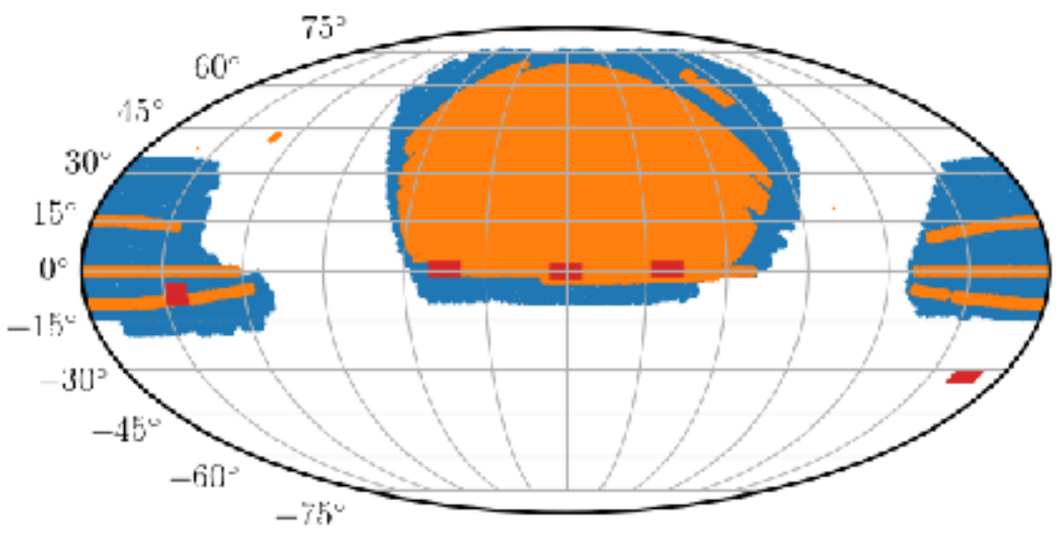
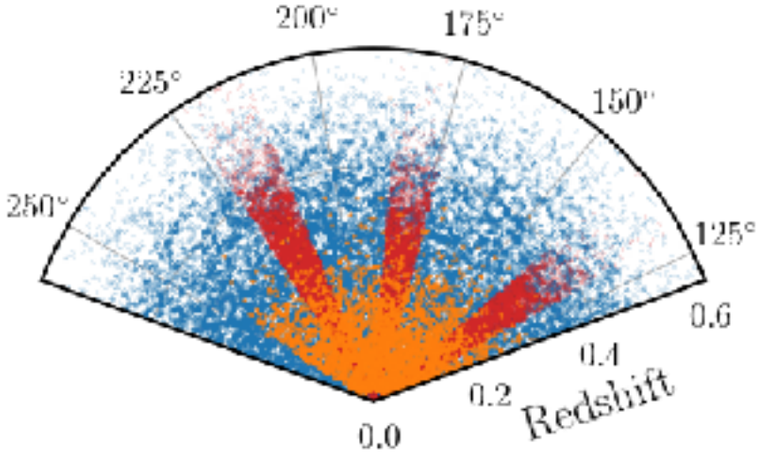
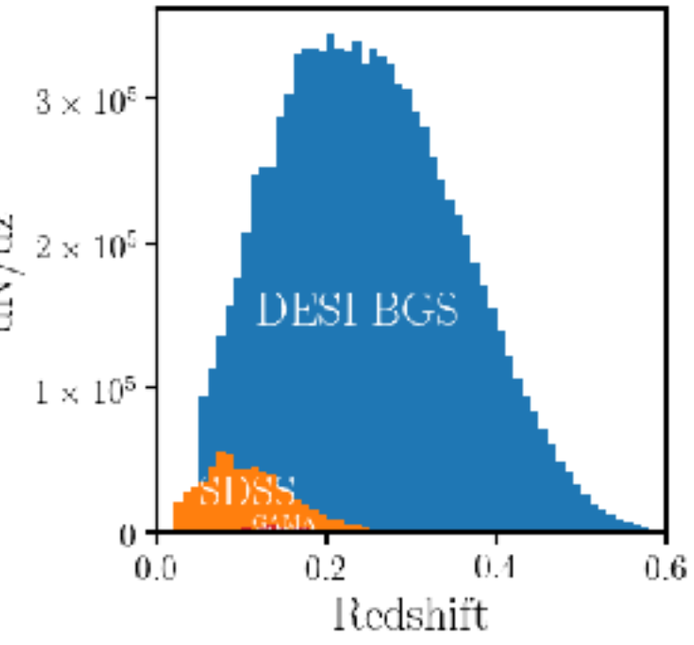
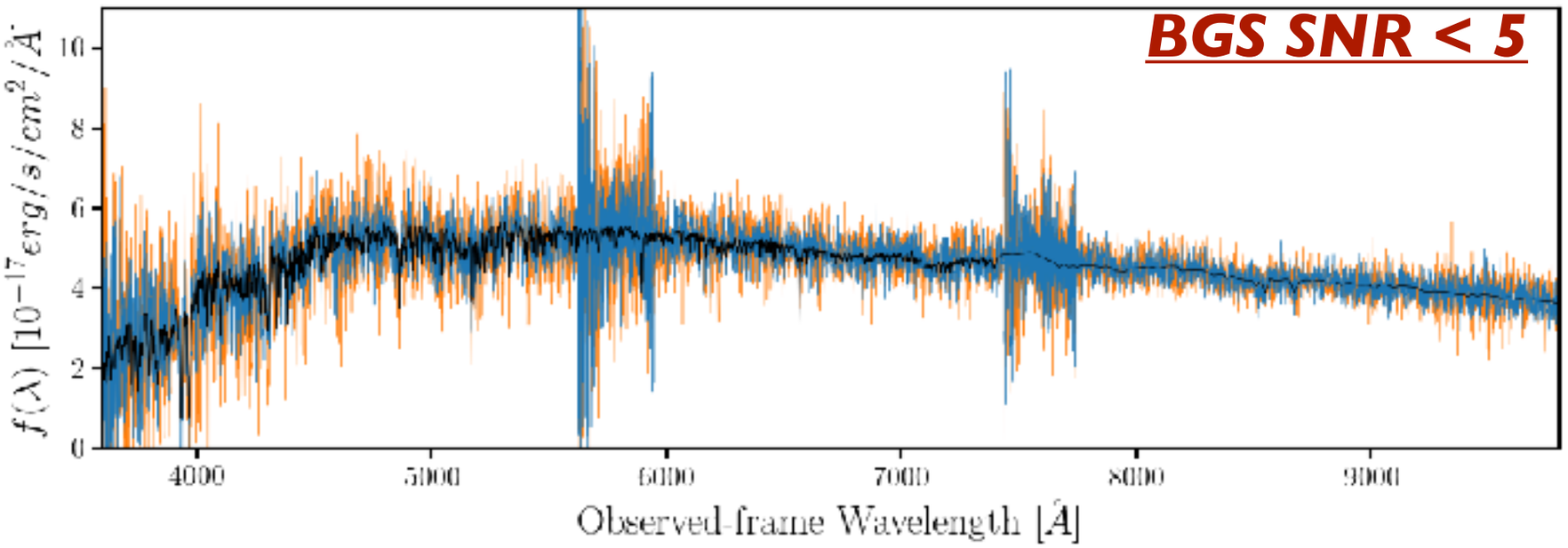






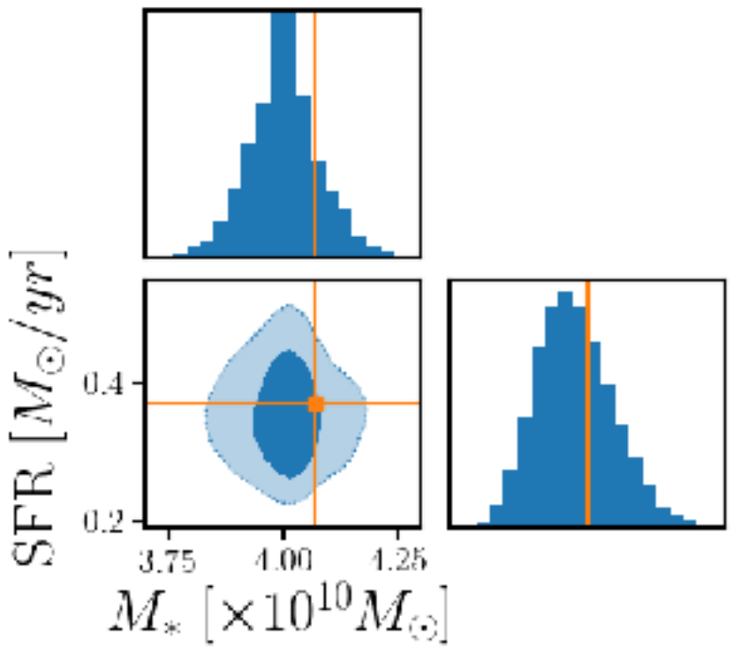
DESI BGS SDSS GAMA

Can we get infer meaningful galaxy properties from DESI spectra?



Can we get infer meaningful galaxy properties from DESI spectra?

Uncertainties and potential systematic effects?



Can we get infer meaningful galaxy properties from DESI spectra?

Uncertainties and potential systematic effects?

spectral mocks

firefly — Wilkinson et al. (2017)

Fitting Iteratively for Relative Likelihood Analysis

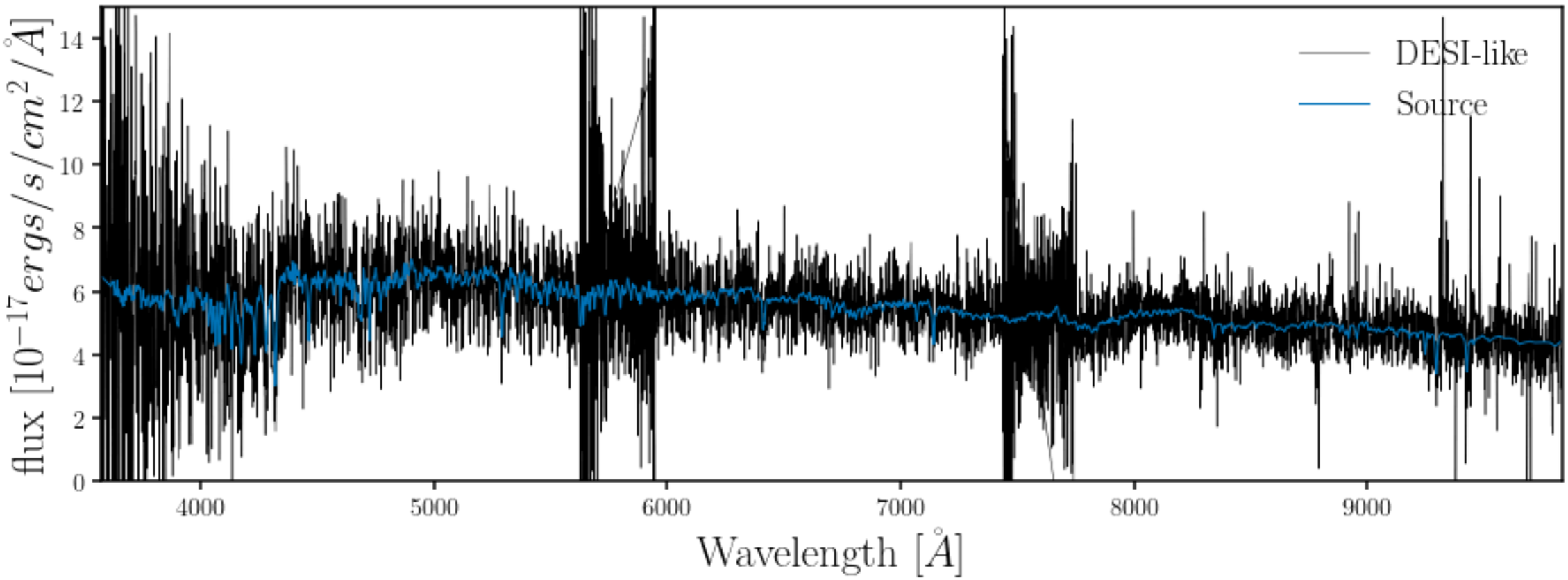
a ***chi-squared minimization fitting*** *code that fits combinations of single-burst stellar population models to spectra, following an iterative best-fitting process controlled by the Bayesian Information Criterion.*

dust attenuation is included using a method that employs a High-Pass Filter to rectify the continuum before fitting.

recovers ***age, metallicity, stellar mass and star formation history***
down to a S/N~5 for moderately dusty systems.

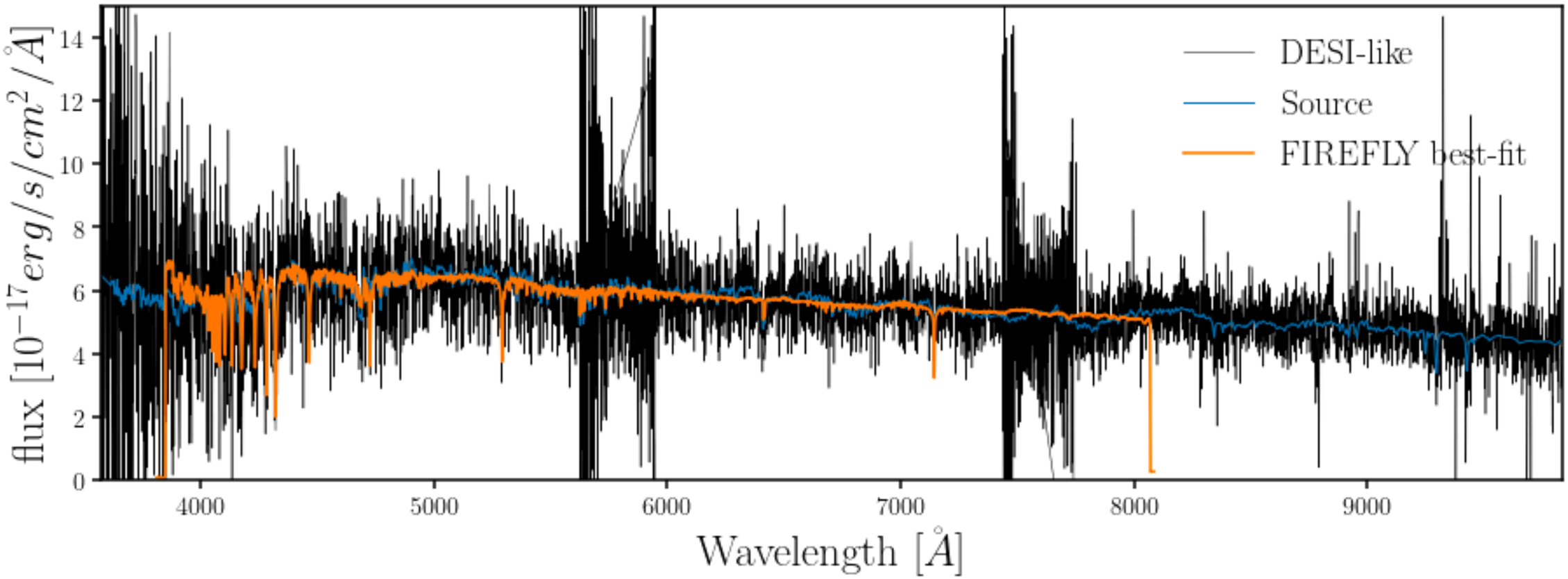
used in SDSS-IV

firefly — *Wilkinson et al. (2017)*



LGal SAM galaxy

firefly — *Wilkinson et al. (2017)*



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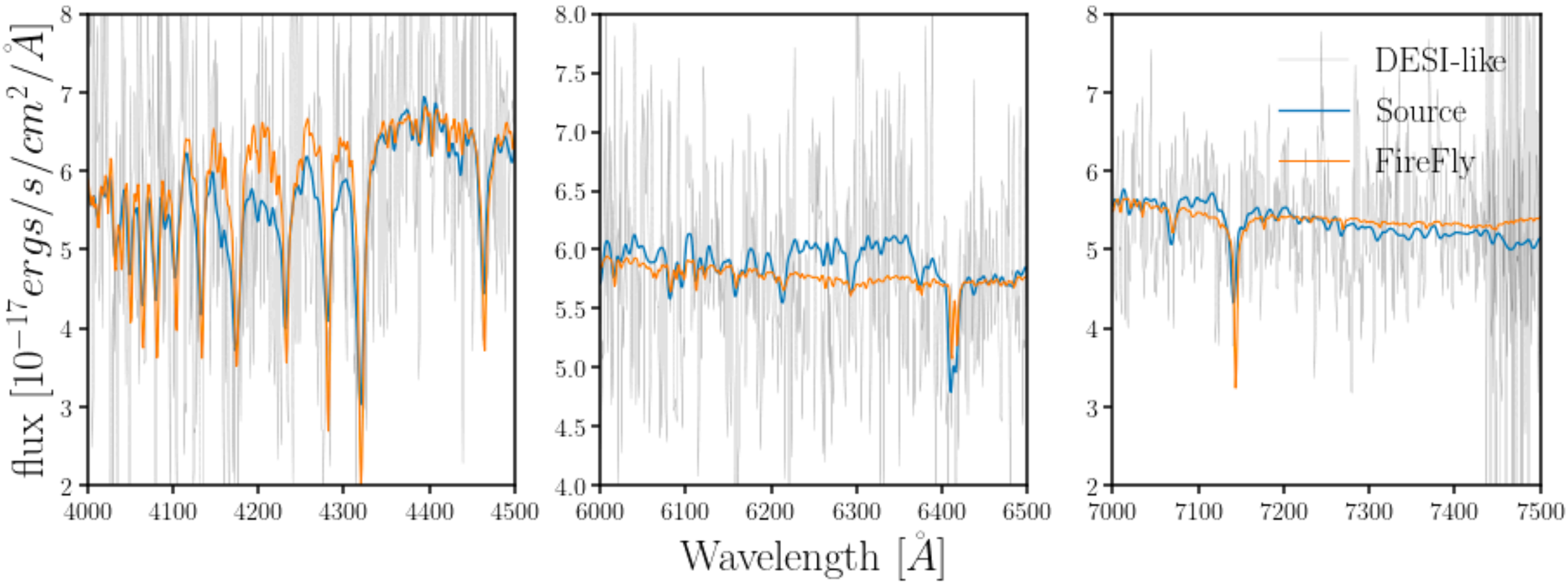

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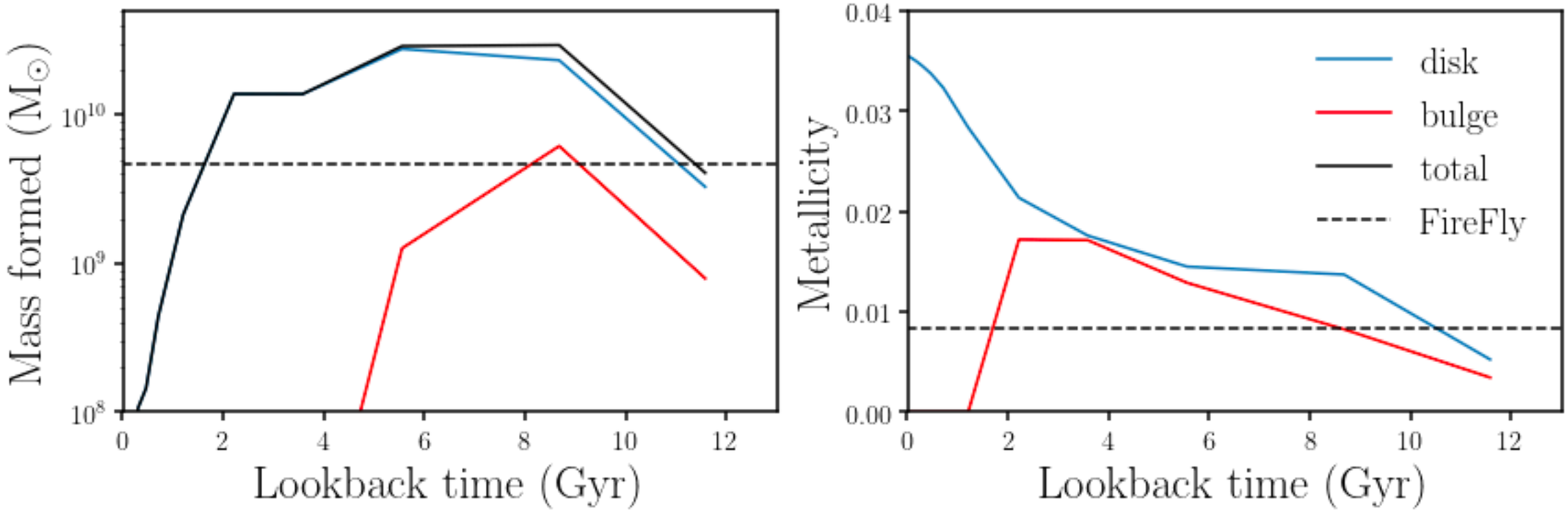
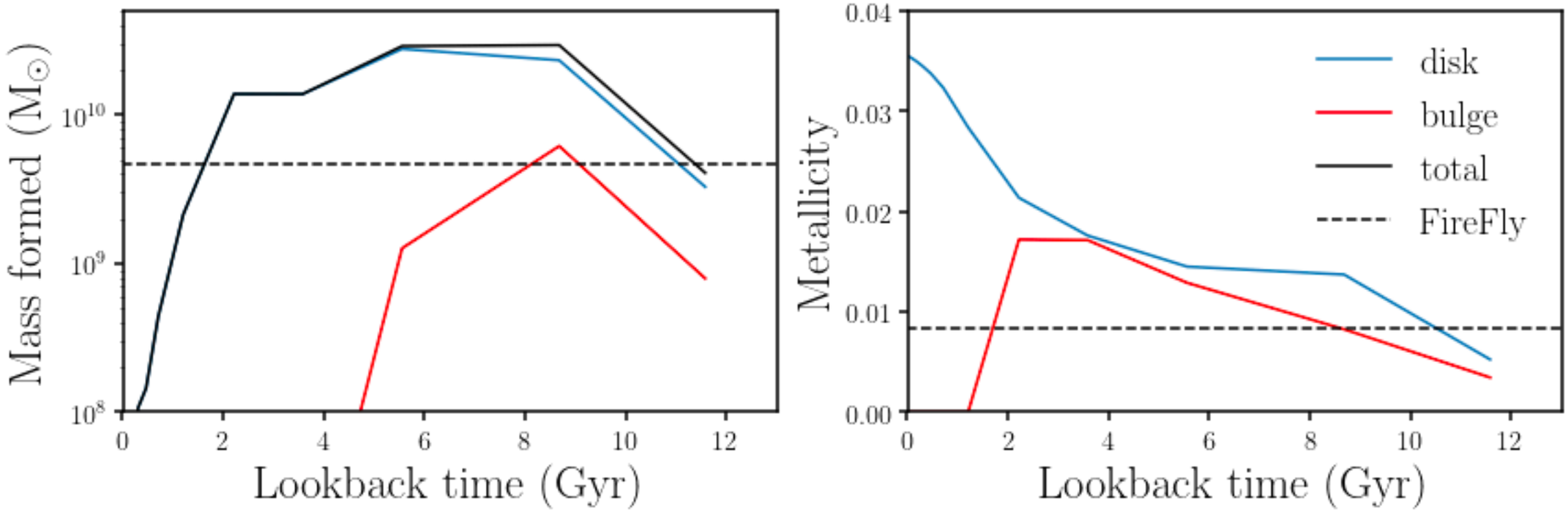
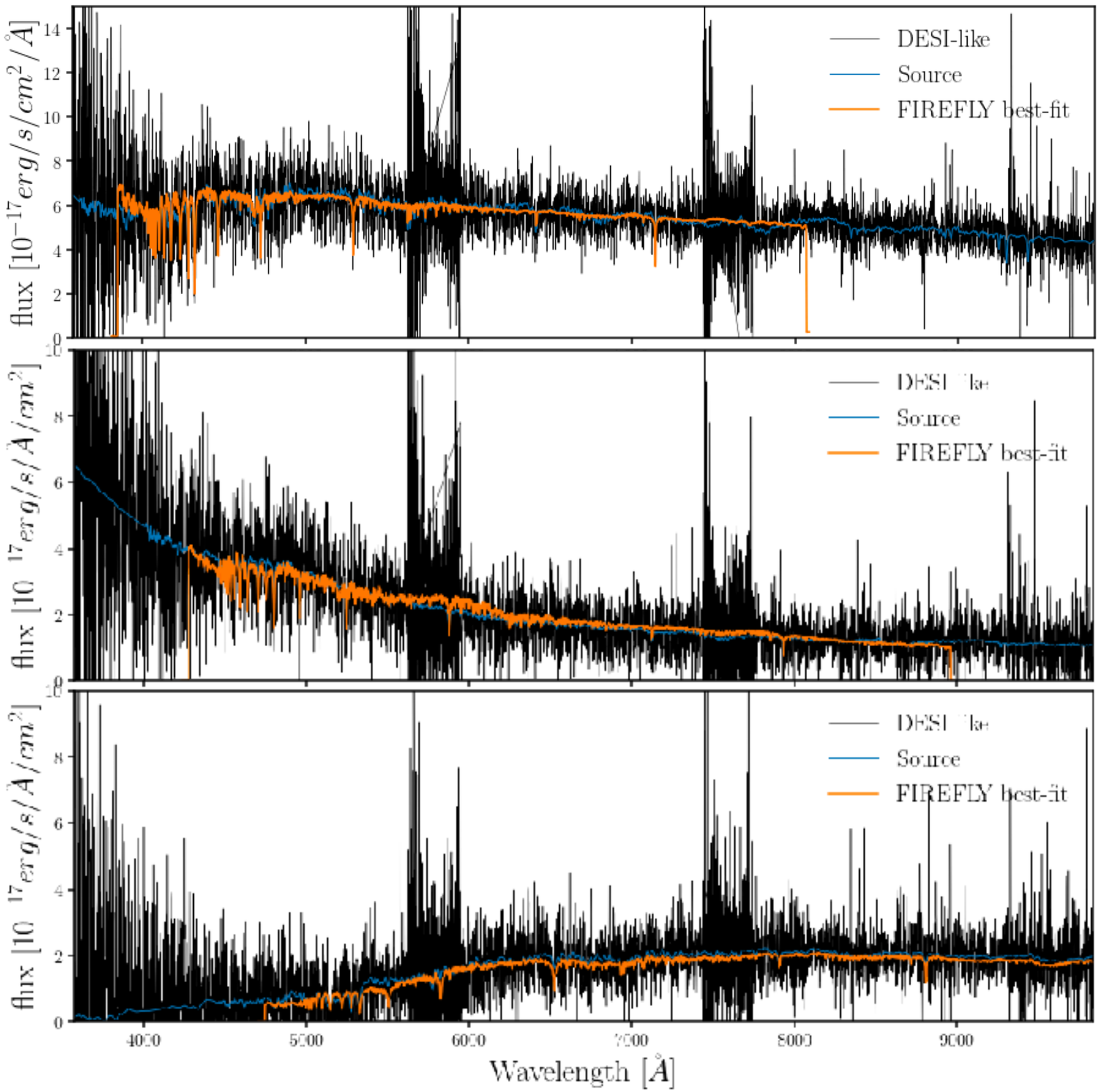


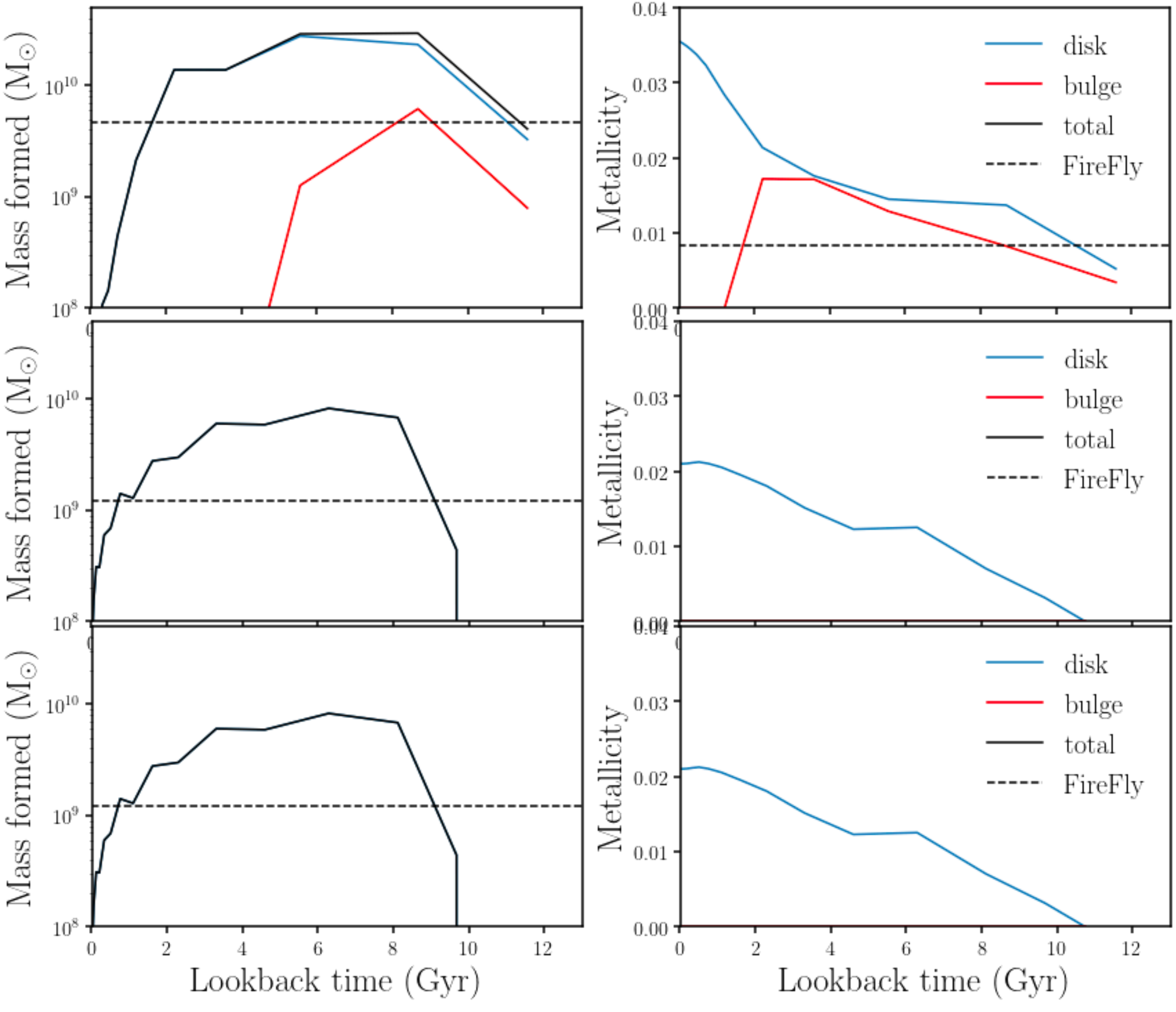
LGal SAM galaxy

firefly — *Wilkinson et al. (2017)*



LGal SAM galaxy


DESI-like
Source
FIREFLY best-fit
flux $[10^{-17} erg/s/cm^2/\AA]$
DESI-like
Source
FIREFLY best-fit
flux $[10^{-17} erg/s/\AA/cm^2]$
DESI-like
Source
FIREFLY best-fit
flux $[10^{-17} erg/s/\AA/cm^2]$
4000
5000
6000
7000
8000
9000
Wavelength $[\AA]$


Mass formed (M⊙)
10^{10}
10^{9}
10^{8}
Metallicity
0.04
0.03
0.02
0.01
0.00
disk
bulge
total
FireFly
0
2
4
6
8
10
12
Lookback time (Gyr)

prospector — *Leja et al. (2017)*

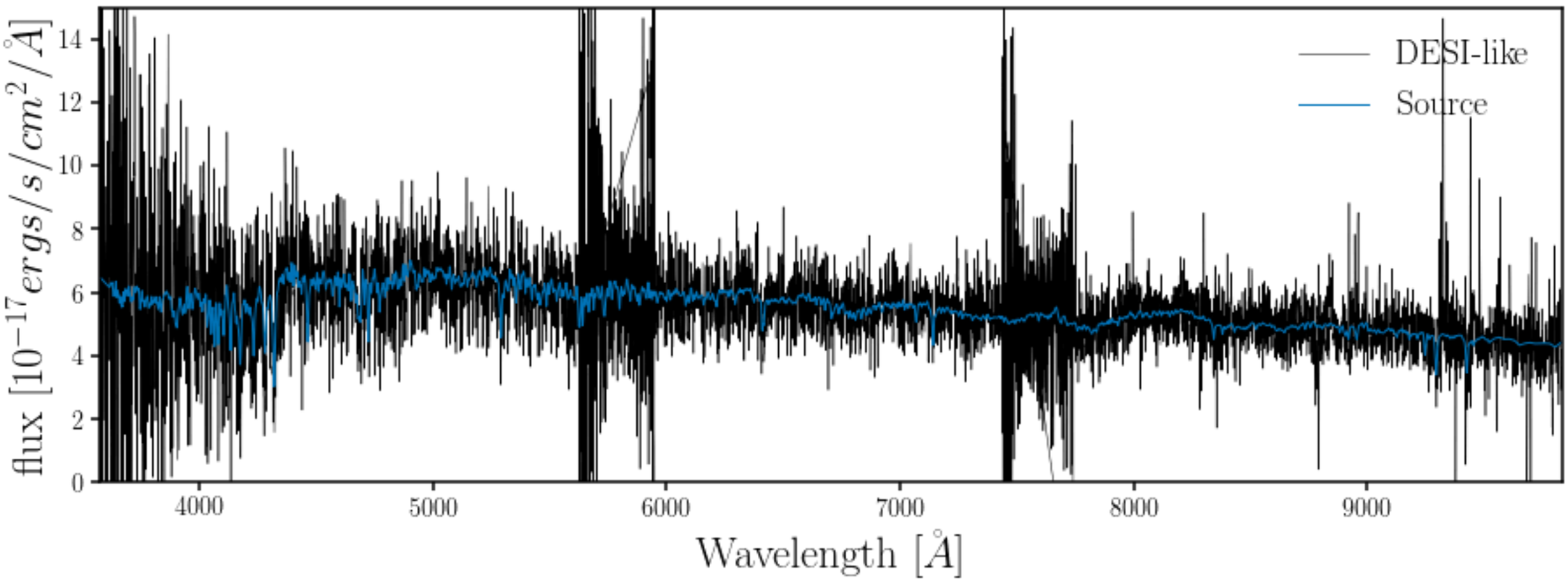
inference of stellar population properties from photometric and/or spectroscopic data using ***Flexible Stellar Population Synthesis*** *(FSPS)*

infer nebular emission from rest UV through Far-IR data

package includes MCMC and dynamic nested sampling for ***principled inference***

easy to use

prospector — *Leja et al. (2017)*



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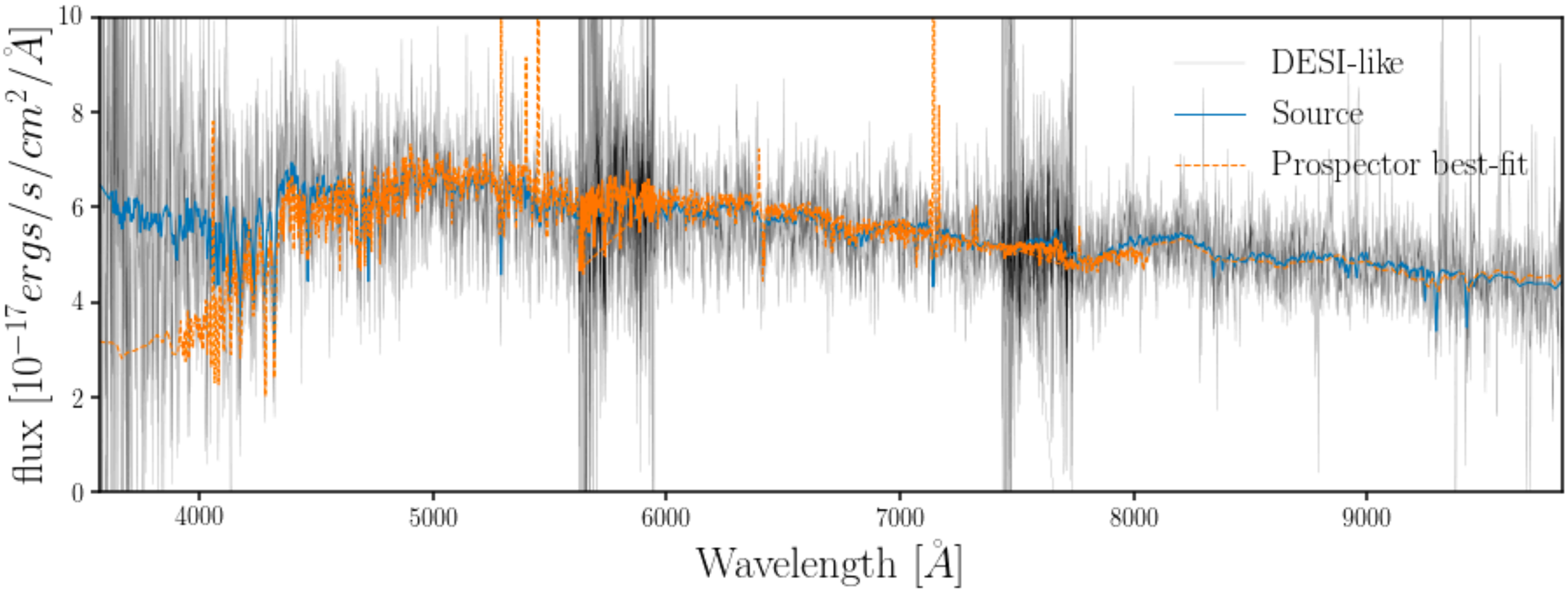

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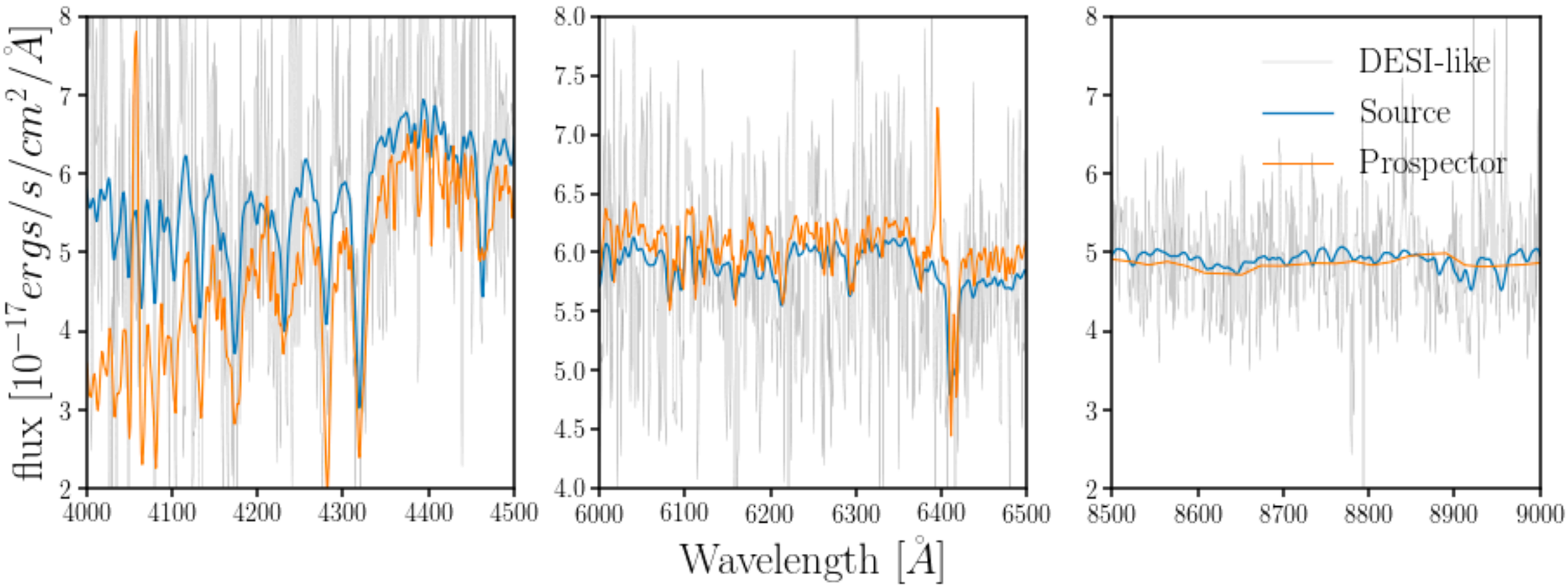

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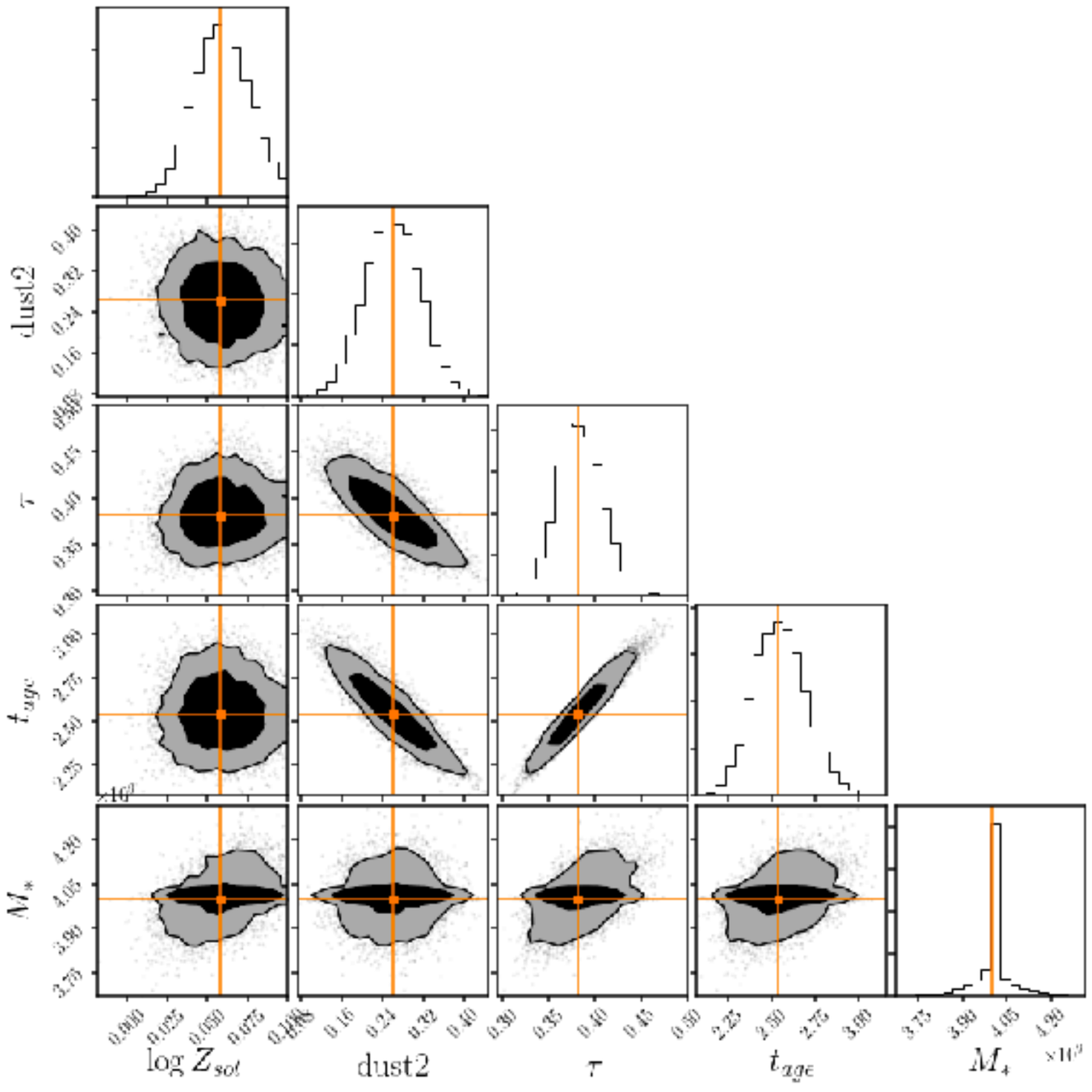

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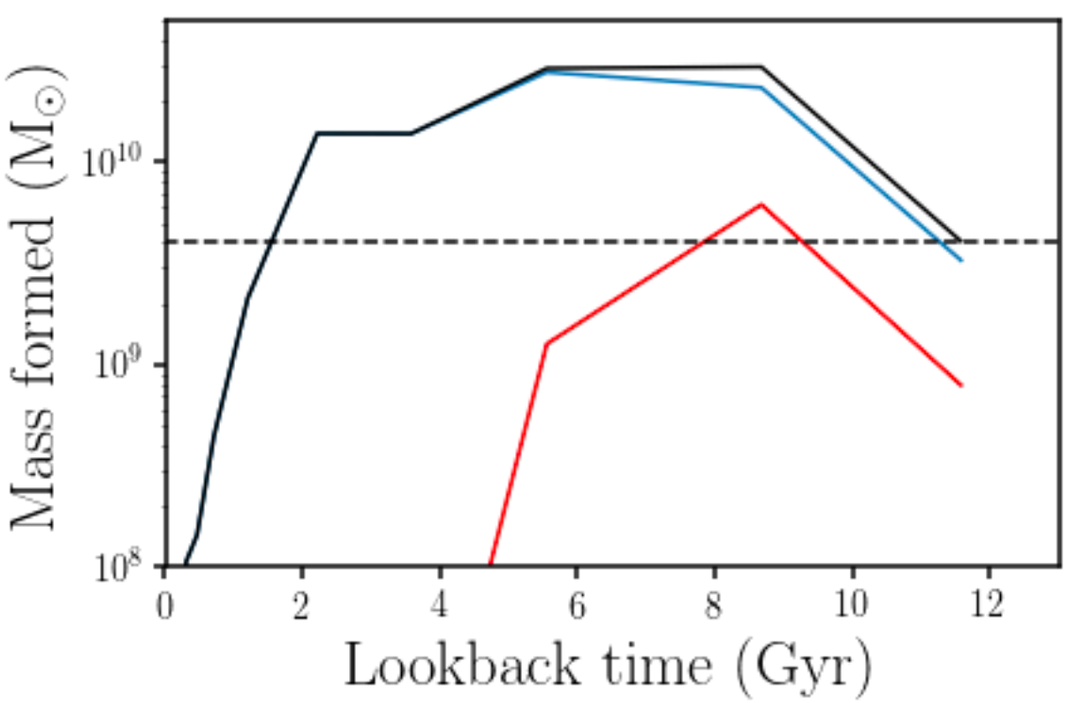
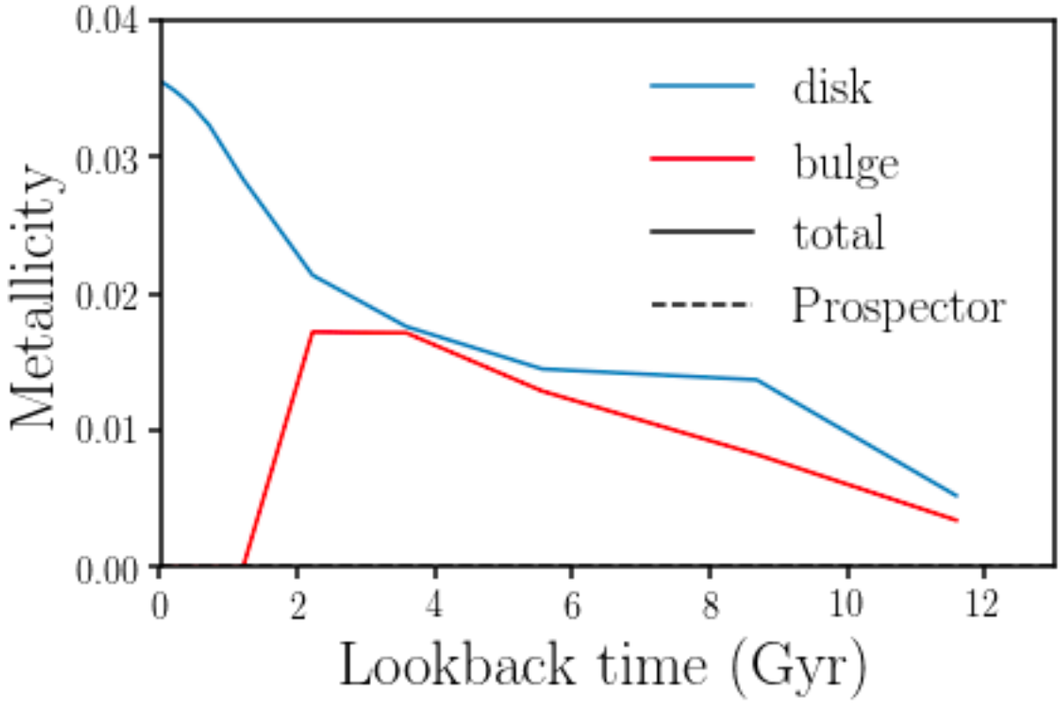
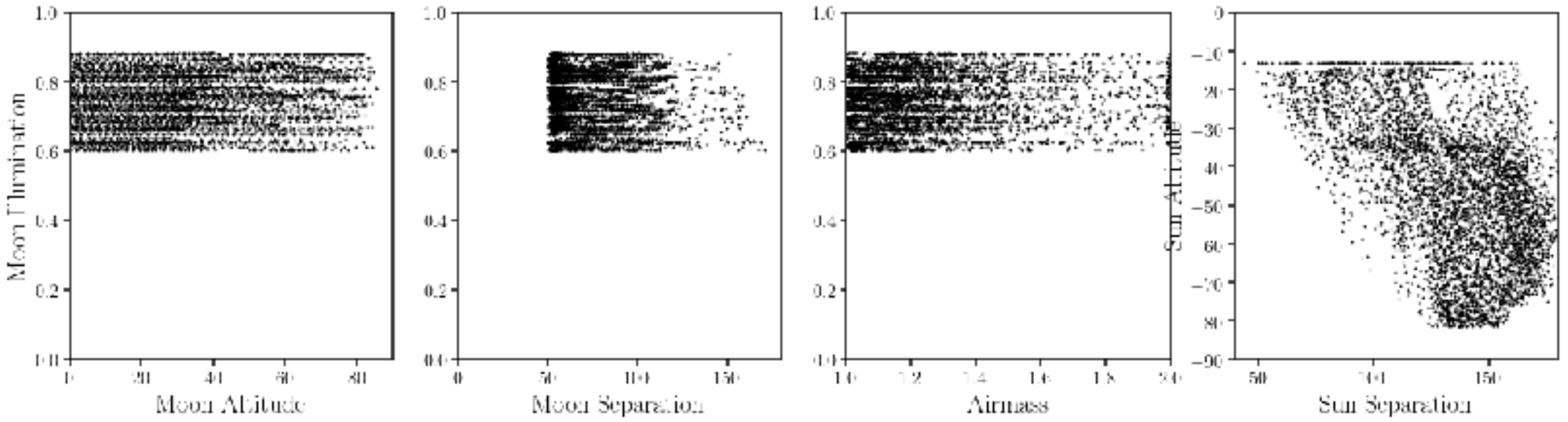




spectral mocks

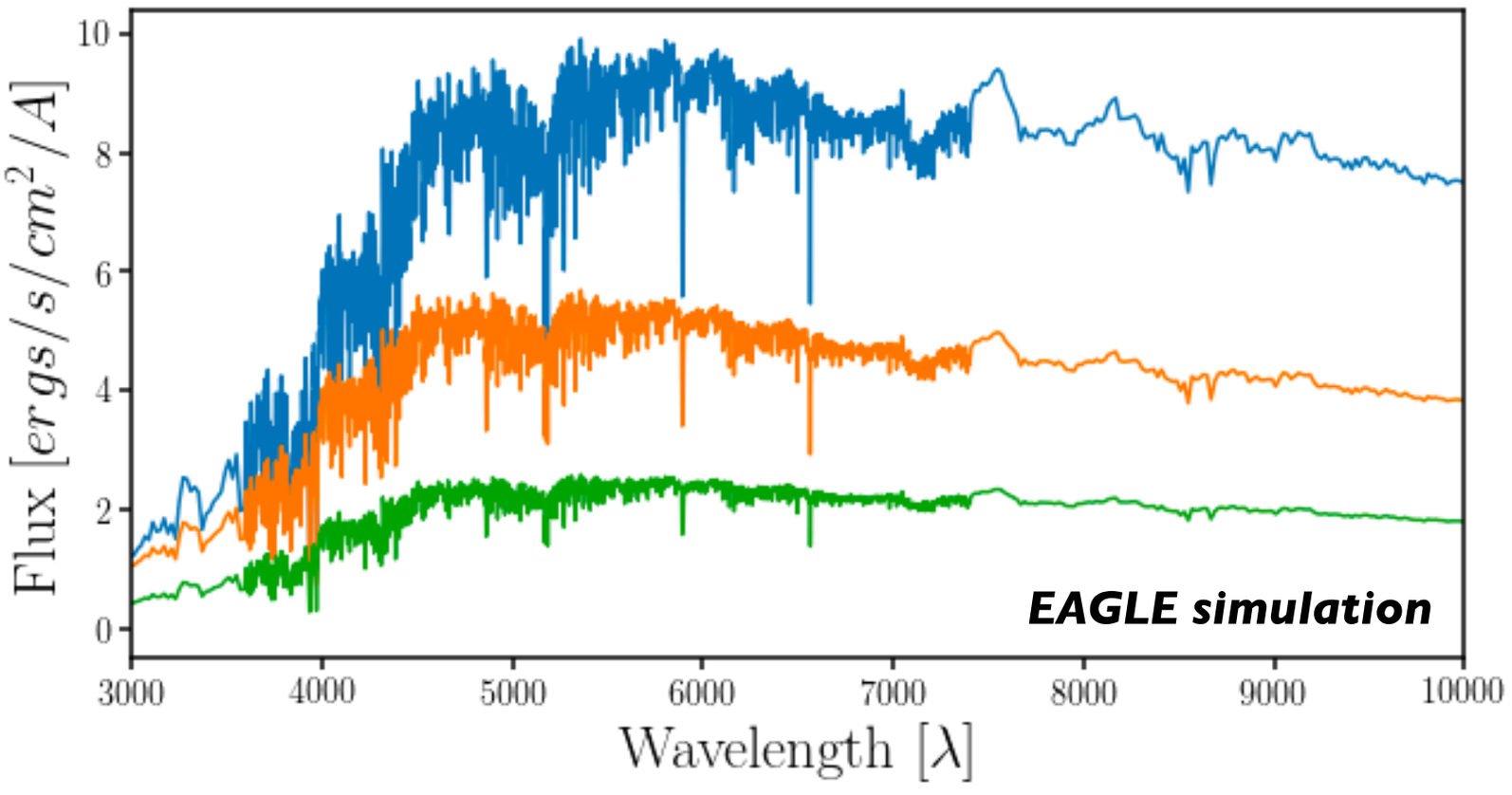
- *How realistically do we want to simulate the observing conditions?*



observing conditions of simulated BGS exposures

spectral mocks

- *How realistically do we want to simulate the observing conditions?*
- *How do we want to make utilize hydro sims?*



spectral mocks

- *How realistically do we want to simulate the observing conditions?*
- *How do we want to make utilize hydro sims?*

spectral fitting

- *Which fitting methods do we want to use?*

pPXF *pMcDermid et al. (2015),* ***STECKMAP*** *(Ocvirk et al. 2006),* ***sedfit*** *(Walcher et al. 2006),* ***VESPA*** *(Tojeiro et al. 2007),* ***ULySS*** *(Koleva et al. 2009),* ***TGASPEX****,* ***DynBaS3D*** *(Magris et al. 2015)* ***BEAGLE*** *(Chevallard & Charlot 2016),* ***FIREFLY*** *(Wilkinson et al. 2017),* ***CIGALE*** *(Boquien et al. 2018),* ***Prospector*** *(Leja et al. 2017),* ***SLUG*** *(Fumagili et al. 2011)*

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