The star formation history of the Milky Way disk through J-PLUS photometry

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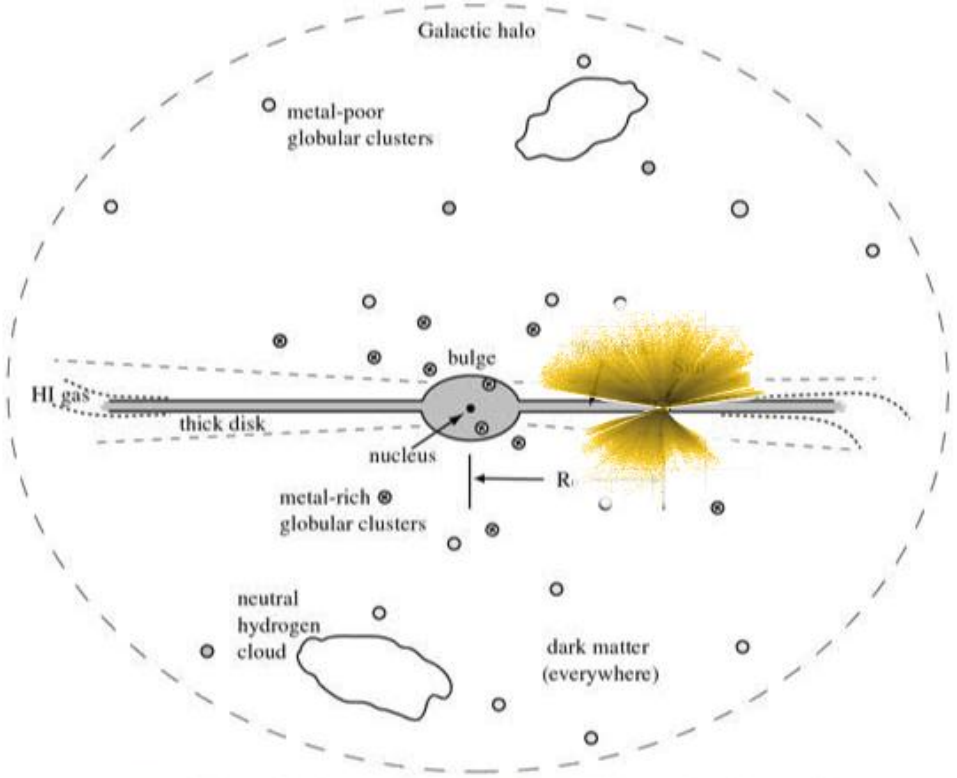
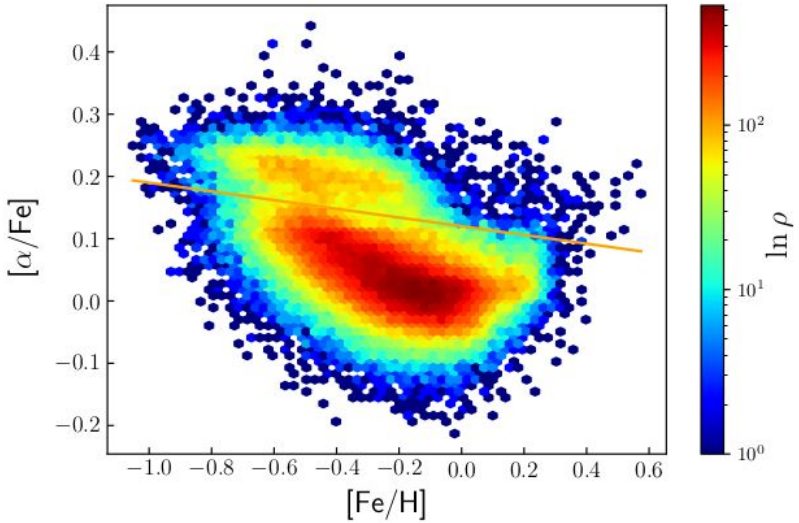
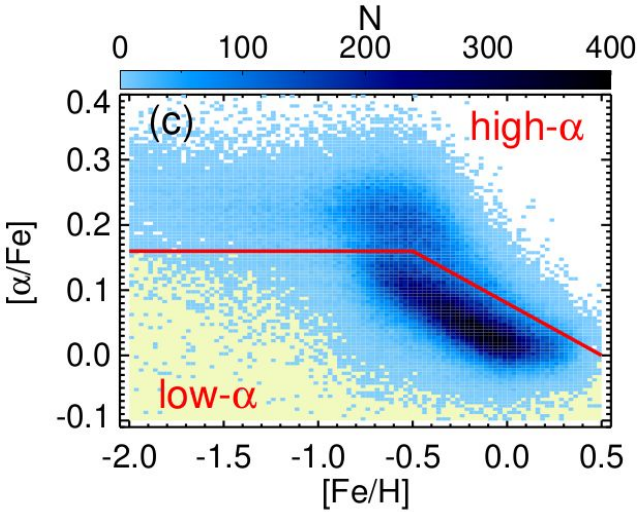
Milky Way (Schematic representation from Sparke & Gallagher, 2007)



Chemistry of the disk

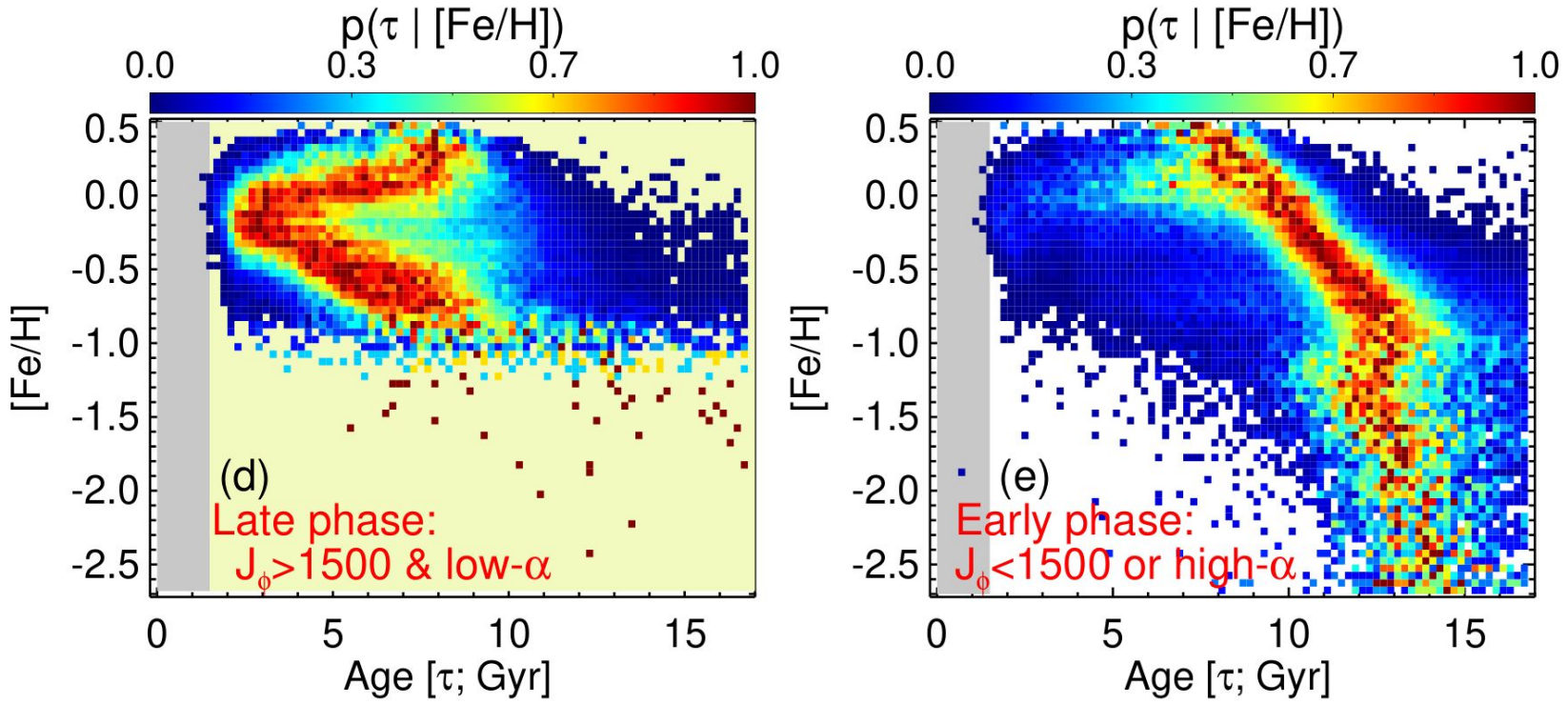


Payel Das et al. (2023)



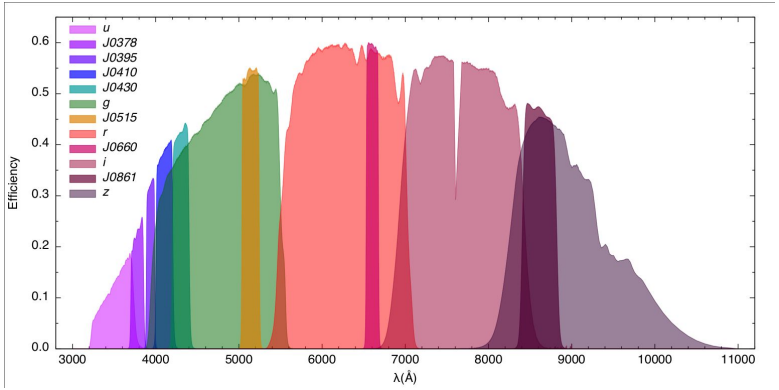
Xiang & Rix (2022)

Formation and evolution of the disk

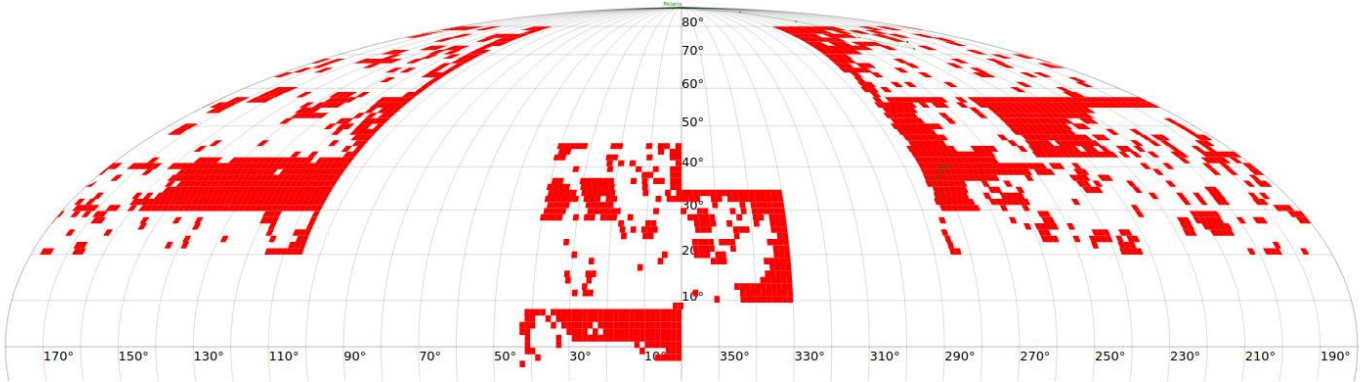


Xiang & Rix (2022)

J-PLUS



Cenarro et al. (2023)



JPLUS DR3

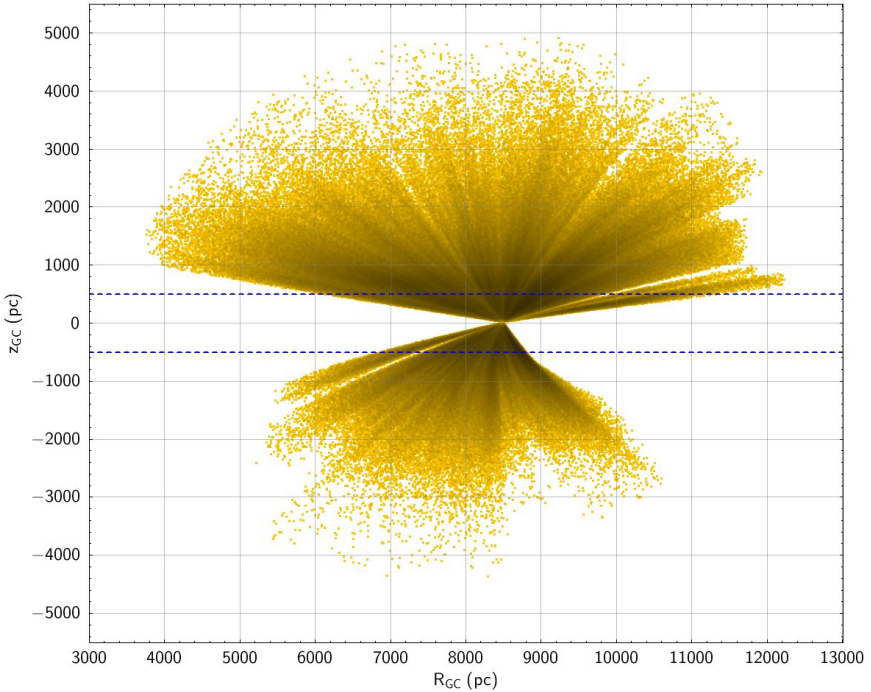
Sample selection

Gaia:

- Parallax > 0.2 mas (dist.<5 kpc)
- ruwe<=1.4

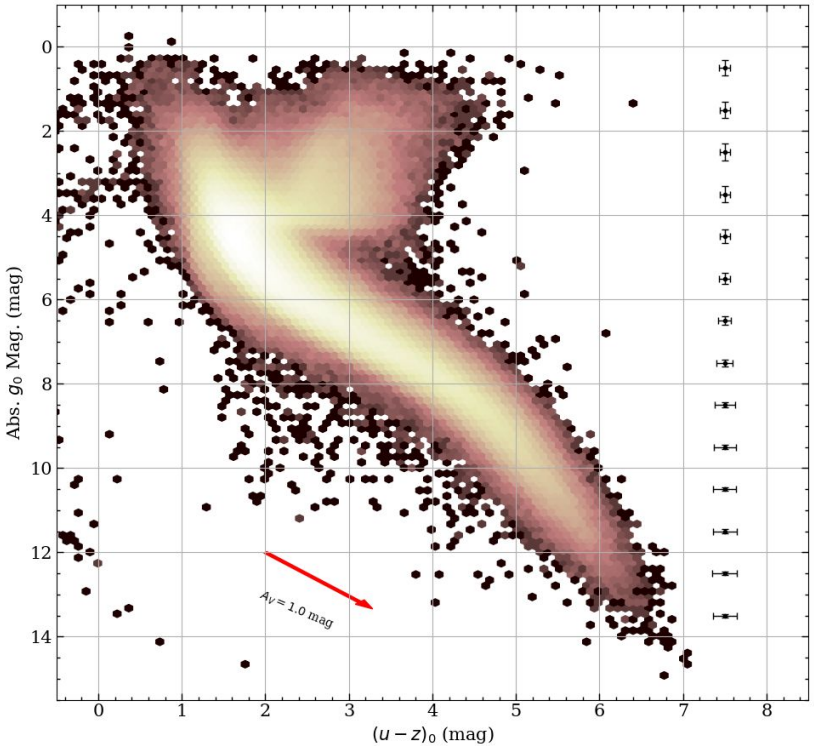
JPLUS DR3:

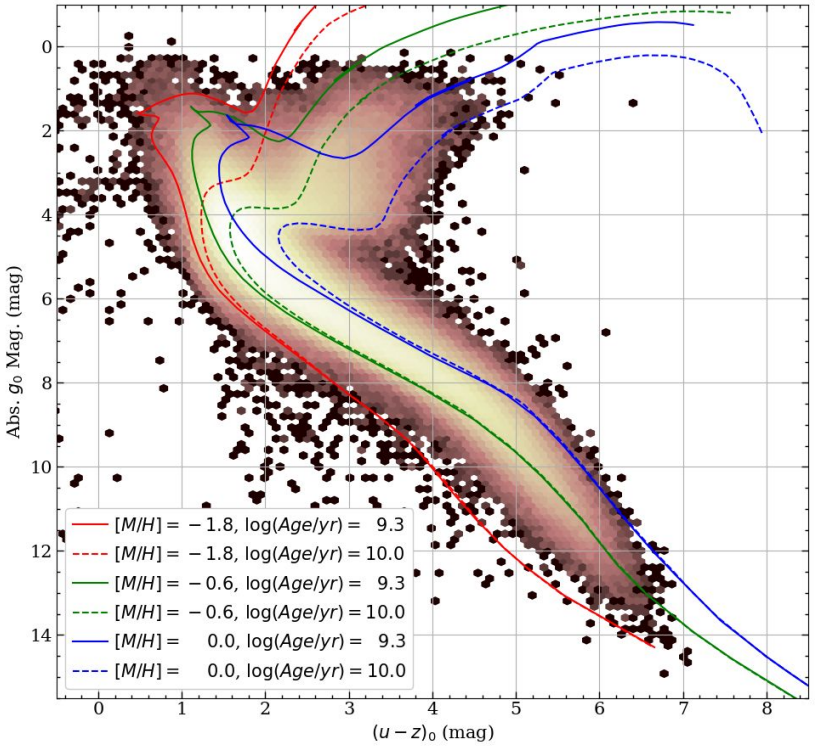
- 14 mag < r_{SDSS} <16.5 mag
- Magnitude errors < 1 mag
- NORM_WMAP_VAL>0.8
- 2048<FLAG(rSDSS)<2051



Color-magnitude diagram

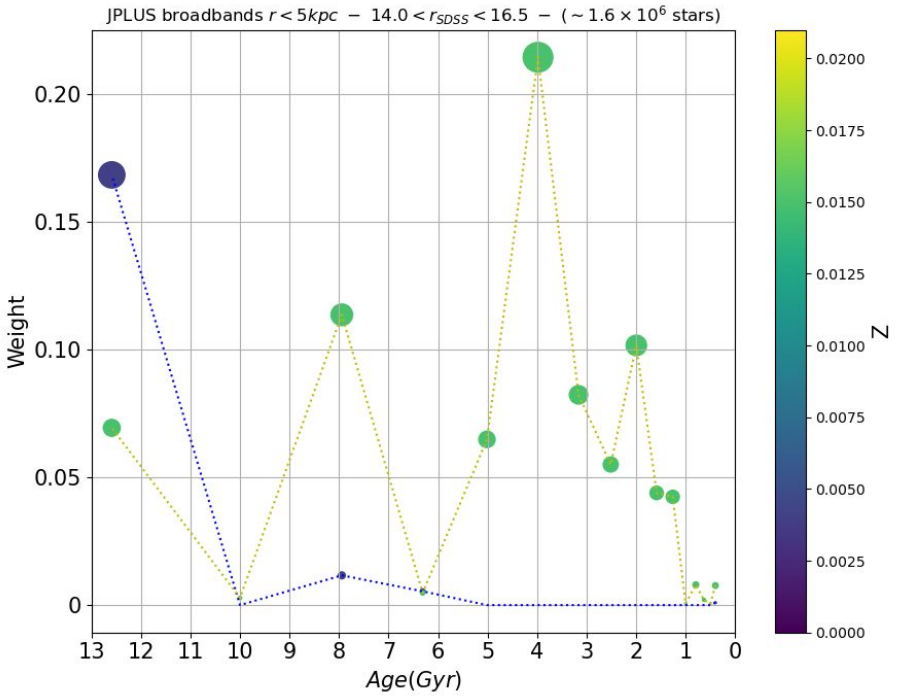
Isoc. from PARSEC
Bressan et al (2012)



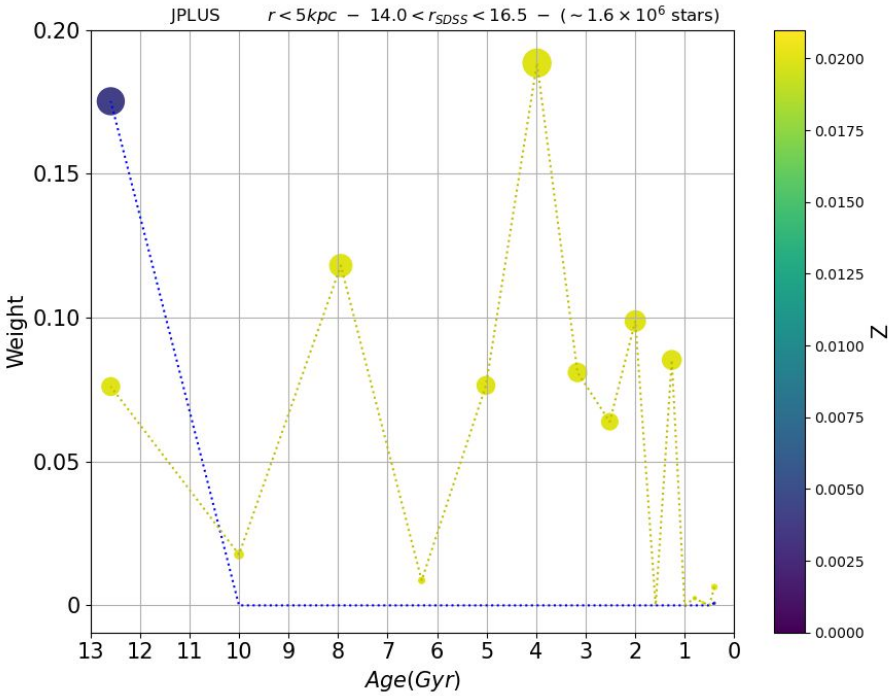


We are using isochrone fitting from Alzate et al. (2021)

Star formation history as told by JPLUS

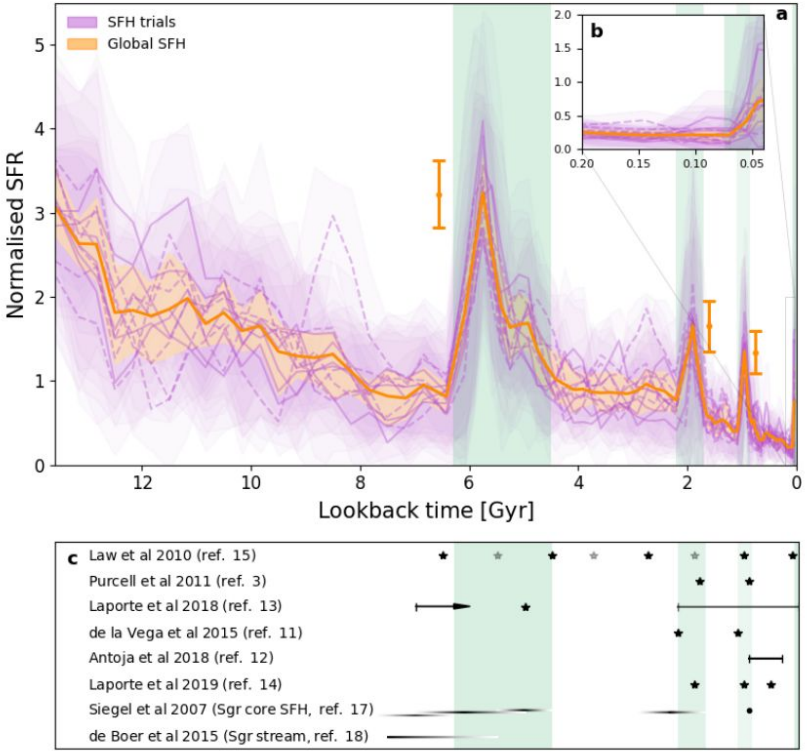


ugriz



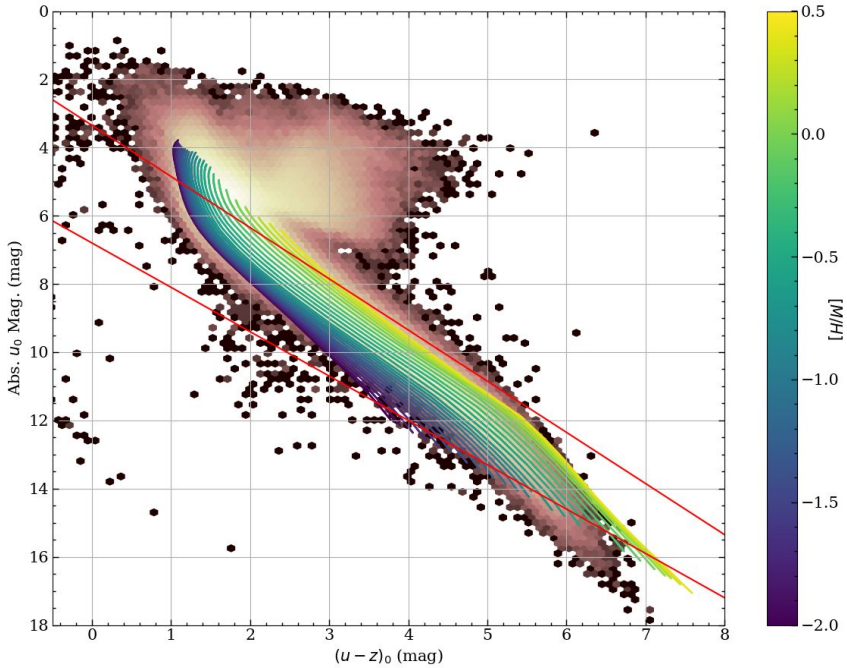
J0378, J0515, J0660, J0861

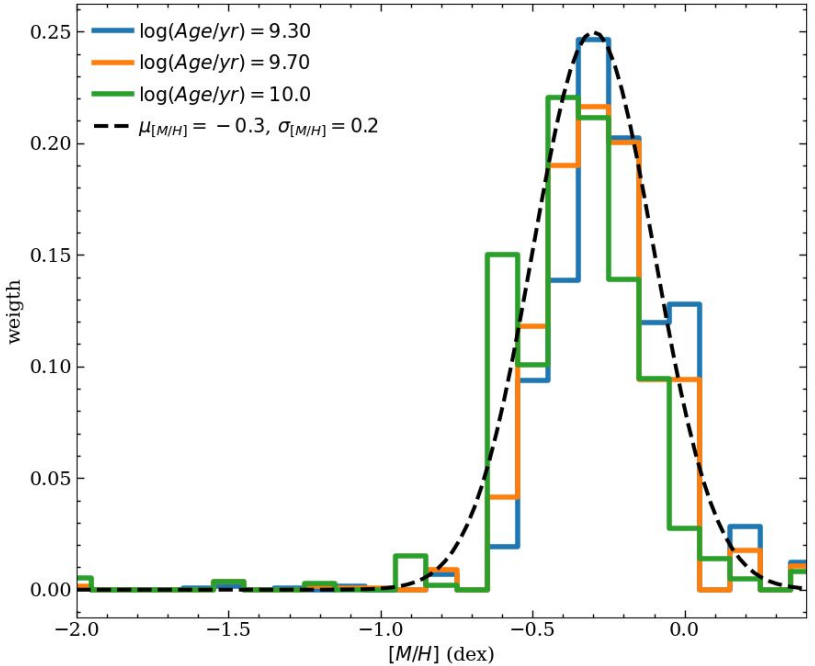
Milky Way and Sagittarius galaxy



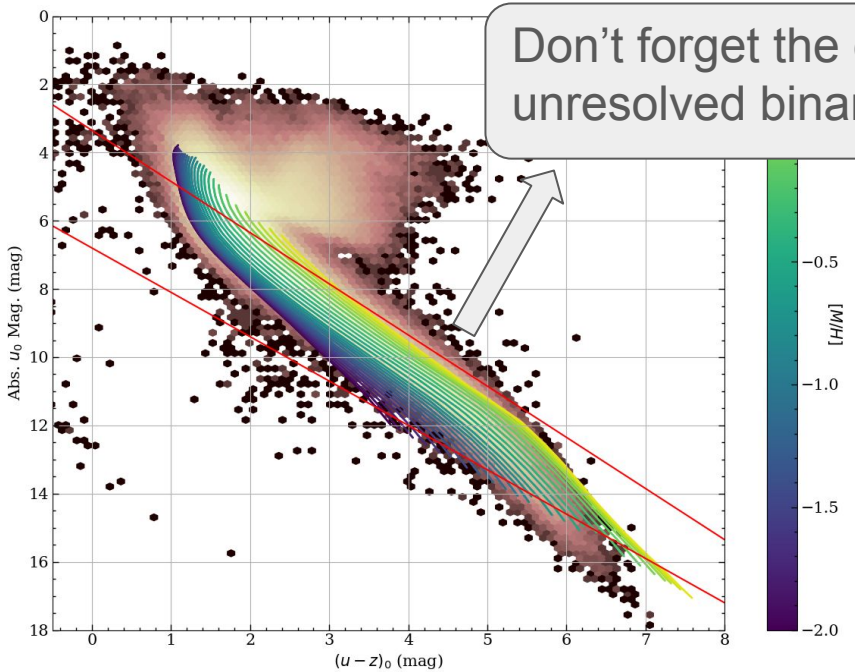
Ruiz-Lara et al. (2020)

Metallicity distribution

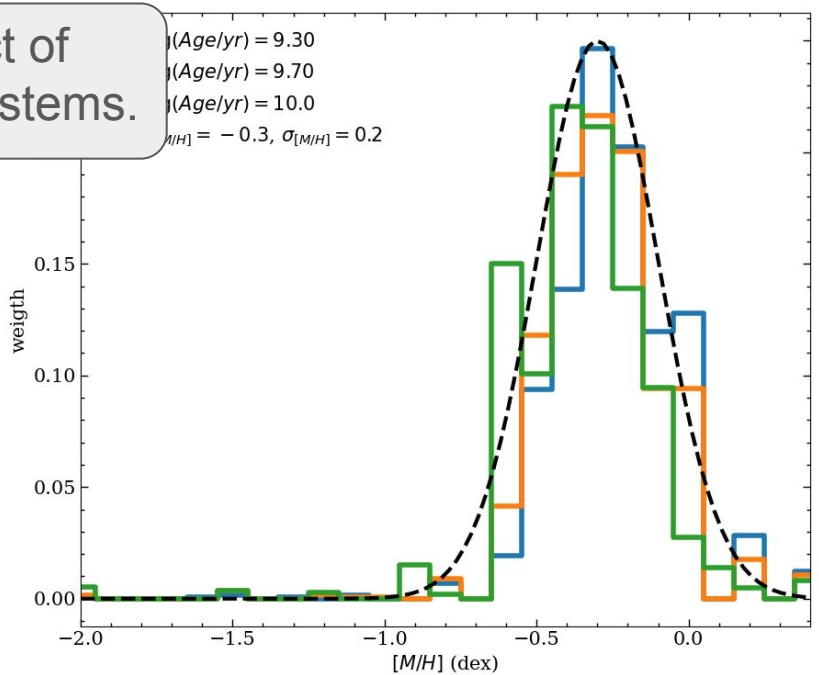




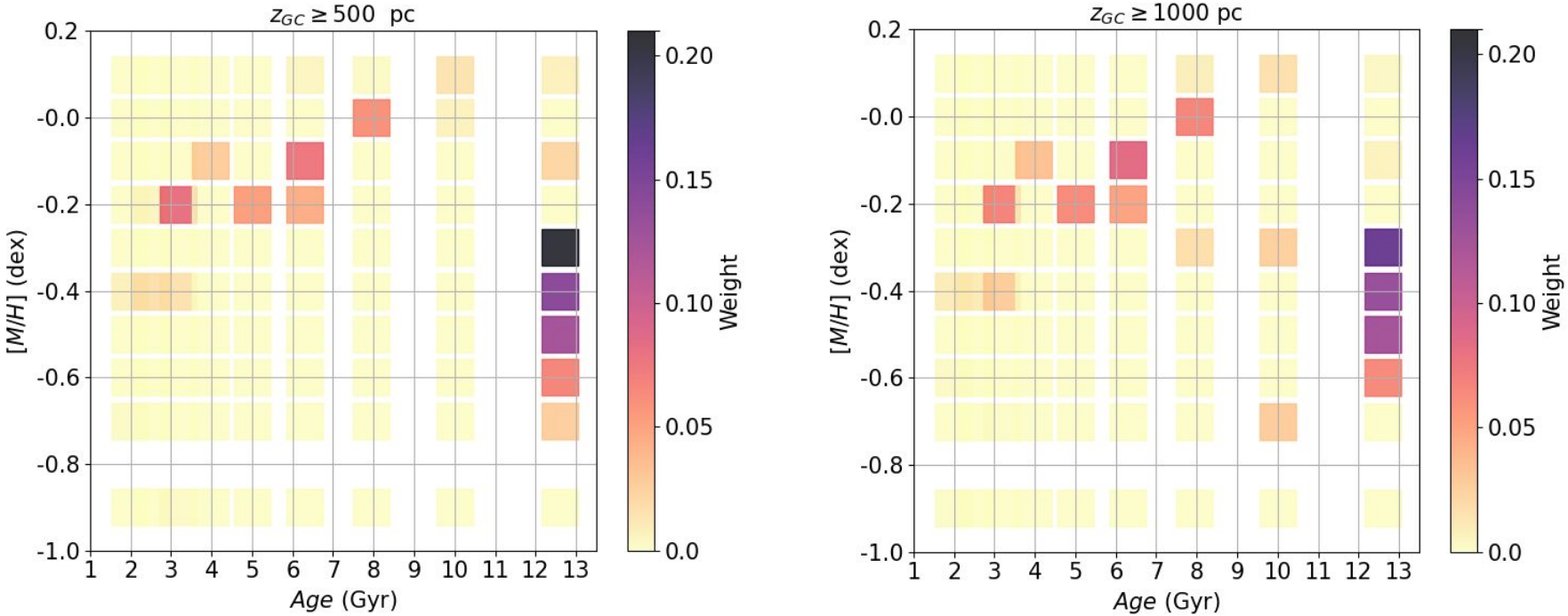
Metallicity distribution



Don’t forget the effect of unresolved binary systems.



Age-metallicity relation inferred for the disk sample



Alzate et al. (In prep.)

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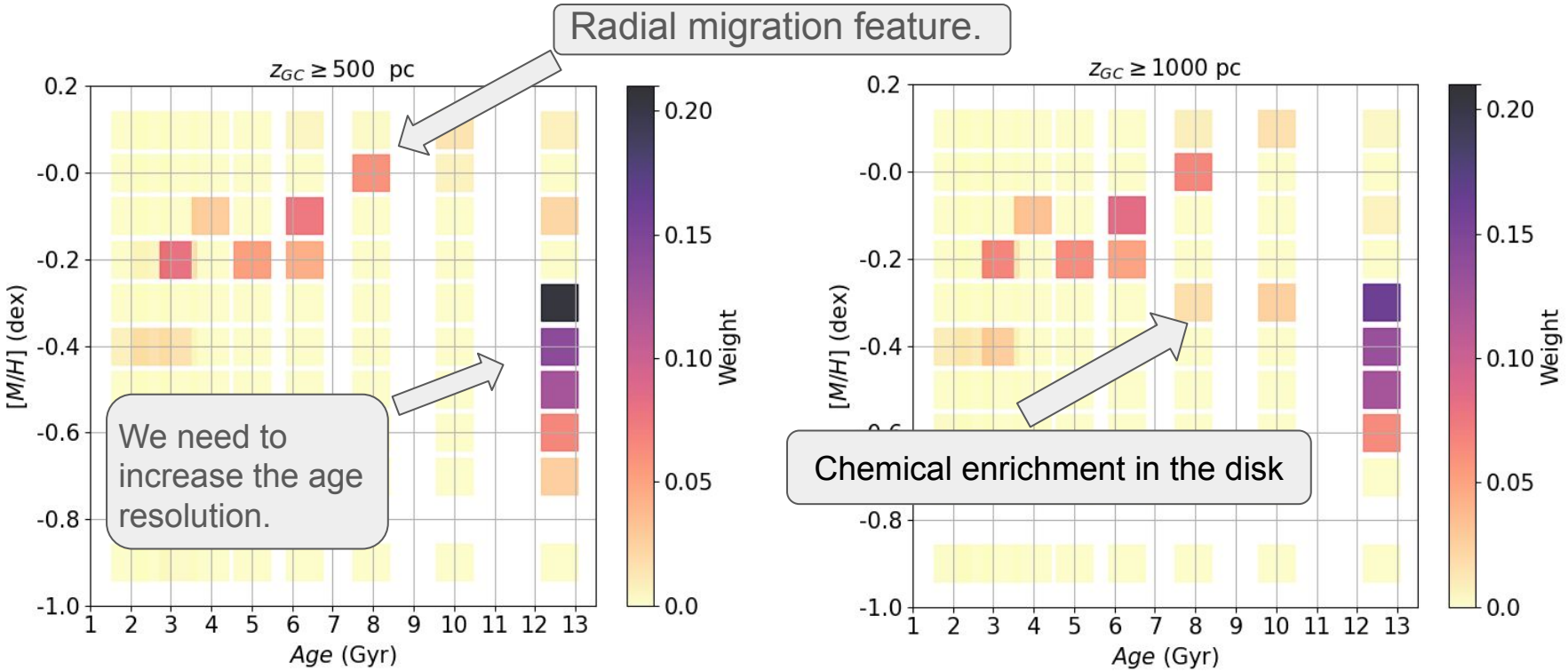
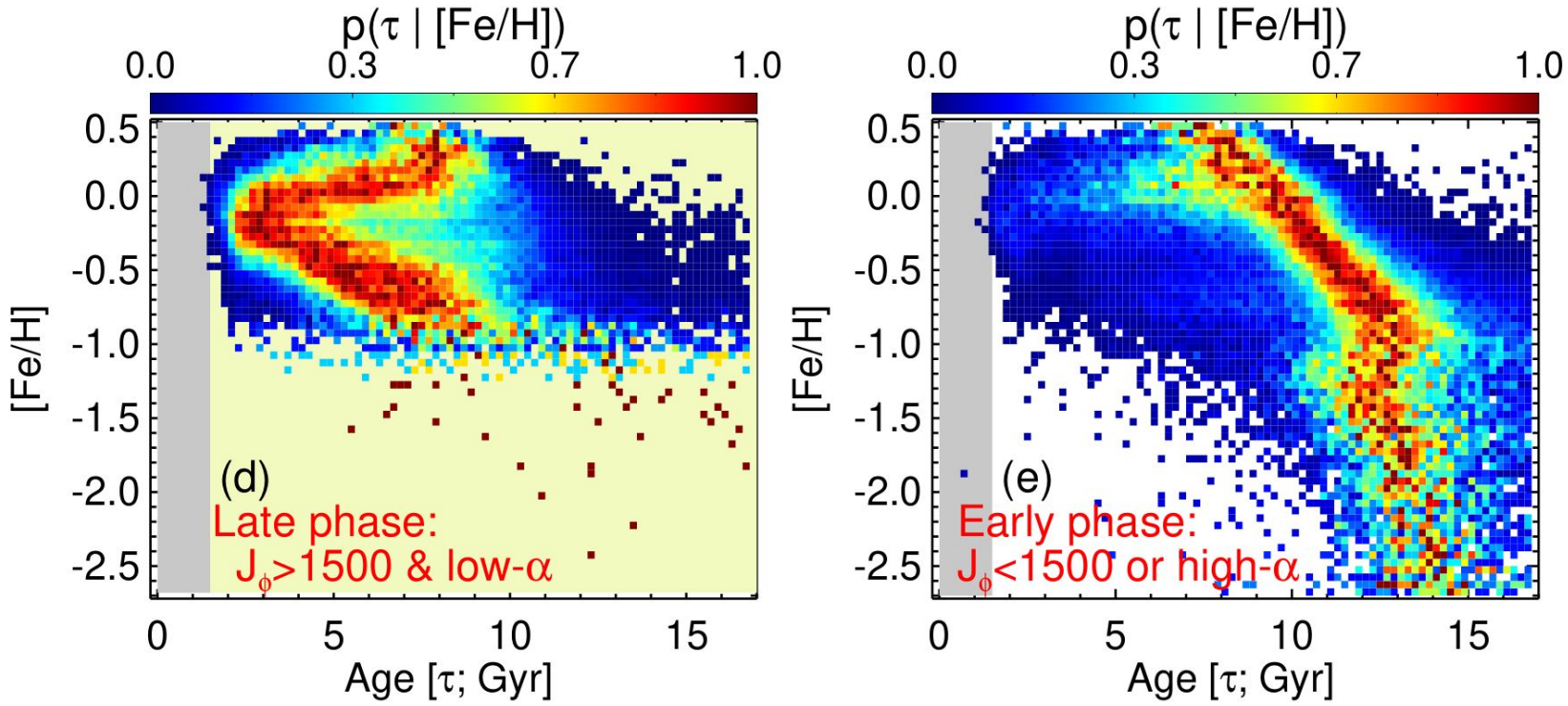


Alzate et al. (In prep.)

Age-metallicity pdf (Figure 2 from Xiang & Rix, 2022)



Some conclusions

- The JPLUS DR3 catalog contains observed stellar photometry with enough accuracy to observe a CMD with many important features. This data is in agreement with the photometric prediction from PARSEC isochrones.
- Our statistical methodology allowed us to perform reliable inferences of the SFH of the JPLUS disc sample.
- Our results presented enhancements of star formations located in similar epochs as dated by Ruiz-Lara et al. (2020).
- The inferred age-metallicity relations have features that agree with those reported in recent publications.

Work in progress:

- Increase the resolution in our inferred Age-metallicity relations.
- Modest correction on p([M/H]) of the effect produced by unresolved binary stars.
- To complement our inferences of star formation using proper motions and radial velocities.

Thank you for your time

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