Characterizing the Milky Way Stellar Halo

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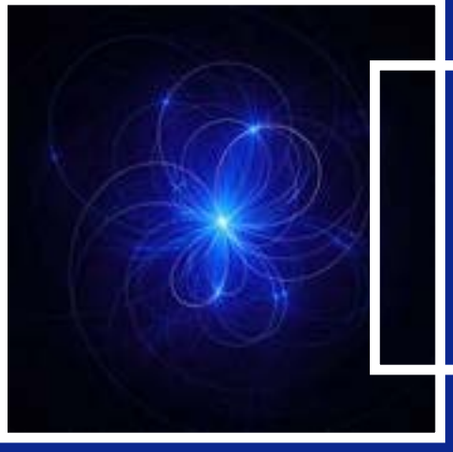
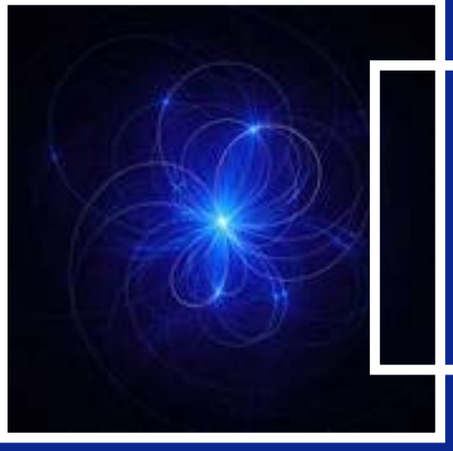


Overview

- Goal: Find more ways to characterize the inner and outer halo (Carollo et al, 2007 and Carollo et al, 2010)
- Method: Examine characteristics and orbits
- Motivation: Understand Milky Way formation
- still a work in progress



Sloan Digital Sky Survey

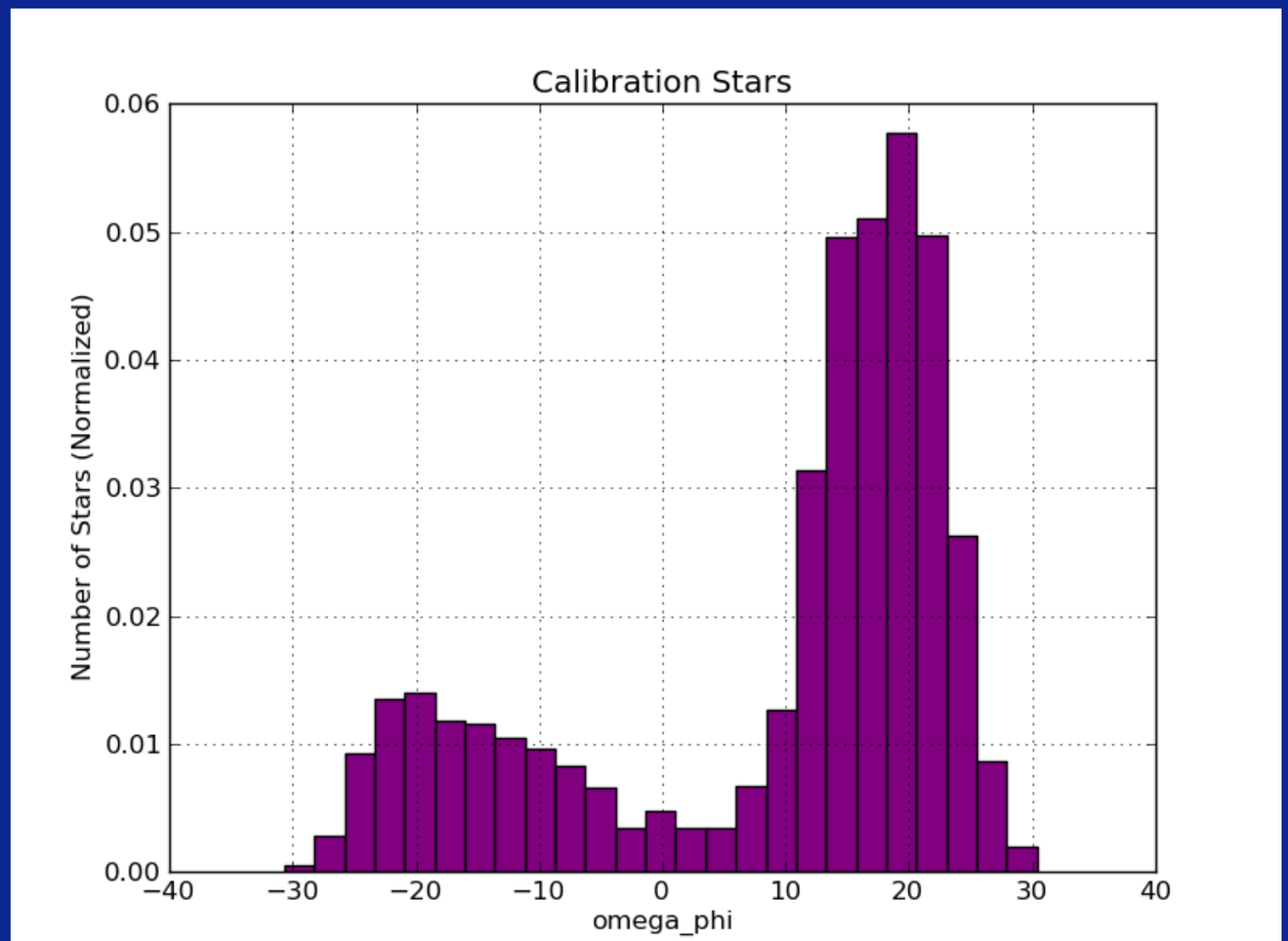
- 2.5 m telescope in New Mexico
- surveying for 10 years
- using the spectroscopic data
- pipeline to interpret data

SEGUE

- subset of SDSS
- ~17,000 stars
- very uniform and local sample

Orbital Analysis

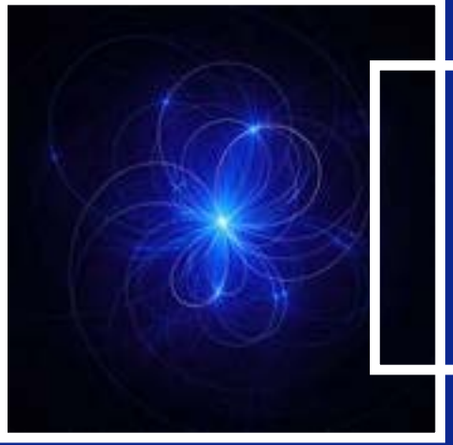
- integrated over 50 Gyr
- potential: halo, disk, bulge
- frequency and time domain behavior



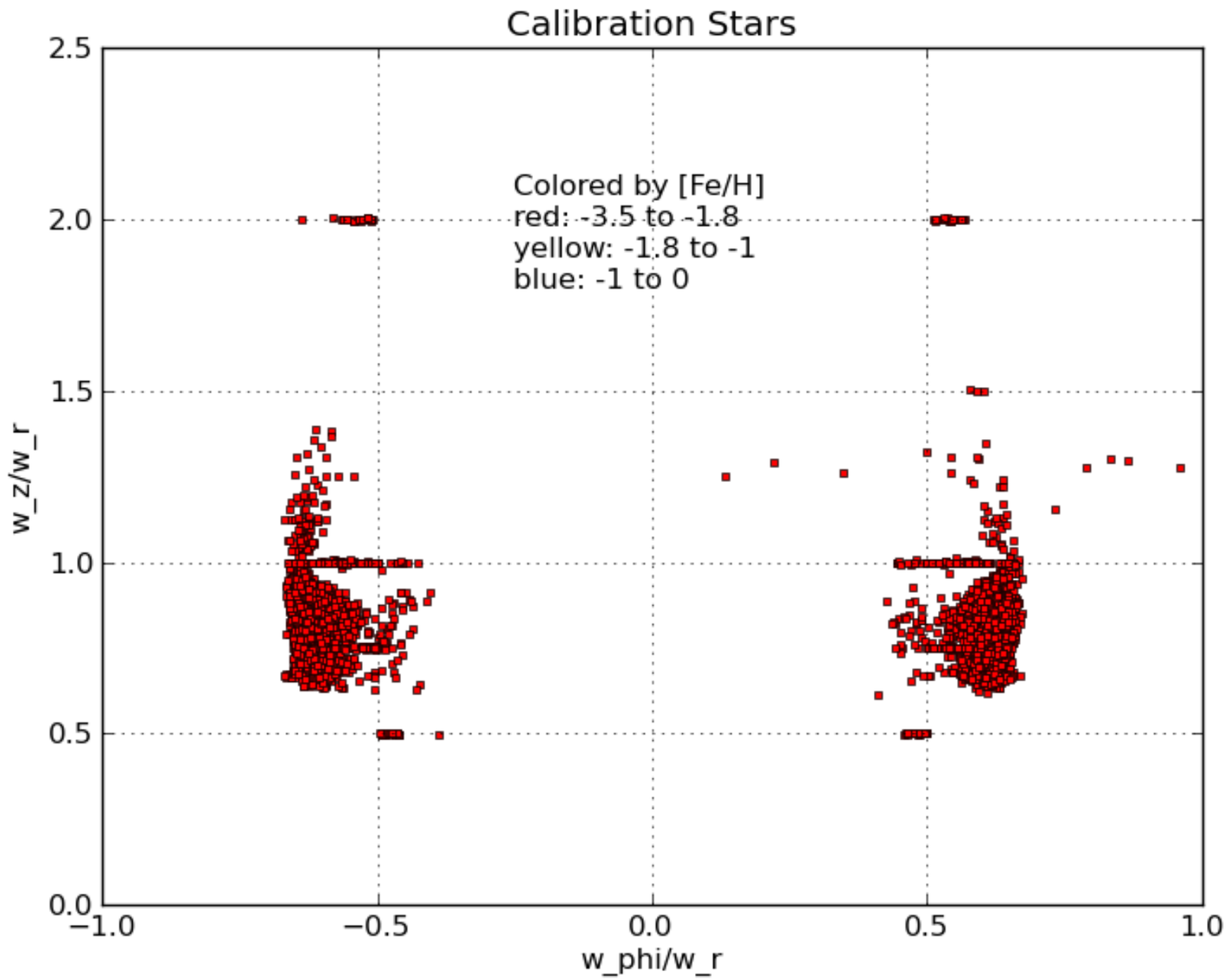
Abundances

$$[\mathrm{Fe/H}] = \log_{10}\left(\frac{N_{\mathrm{Fe}}}{N_{\mathrm{H}}}\right)_{star} - \log_{10}\left(\frac{N_{\mathrm{Fe}}}{N_{\mathrm{H}}}\right)_{sun}$$

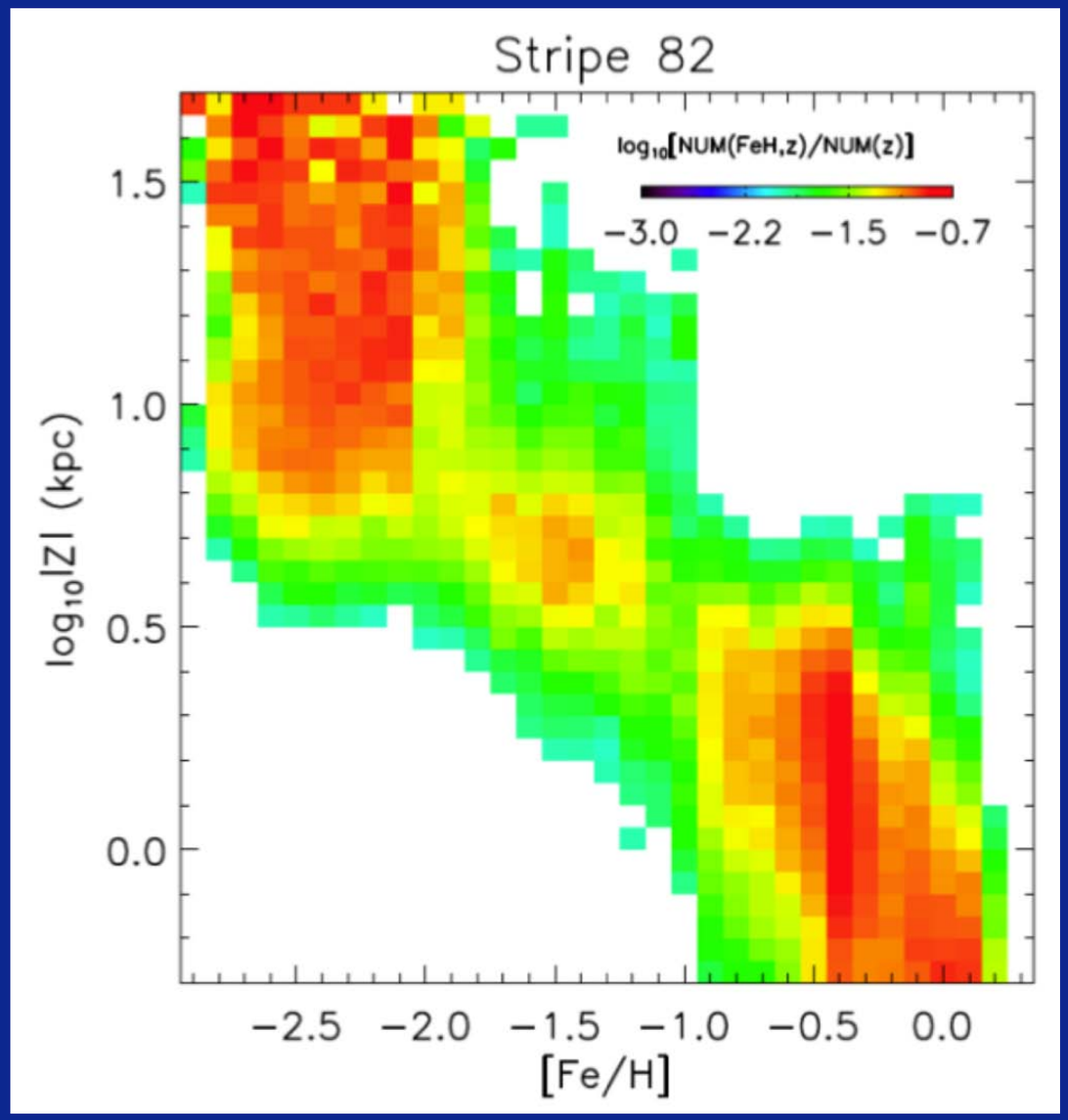
- [Fe/H] : compares Fe present to that of sun
- [α/Fe]: amount of α elements (this case Mg) to Fe
- suggests where stars formed
- suggests how old a star is



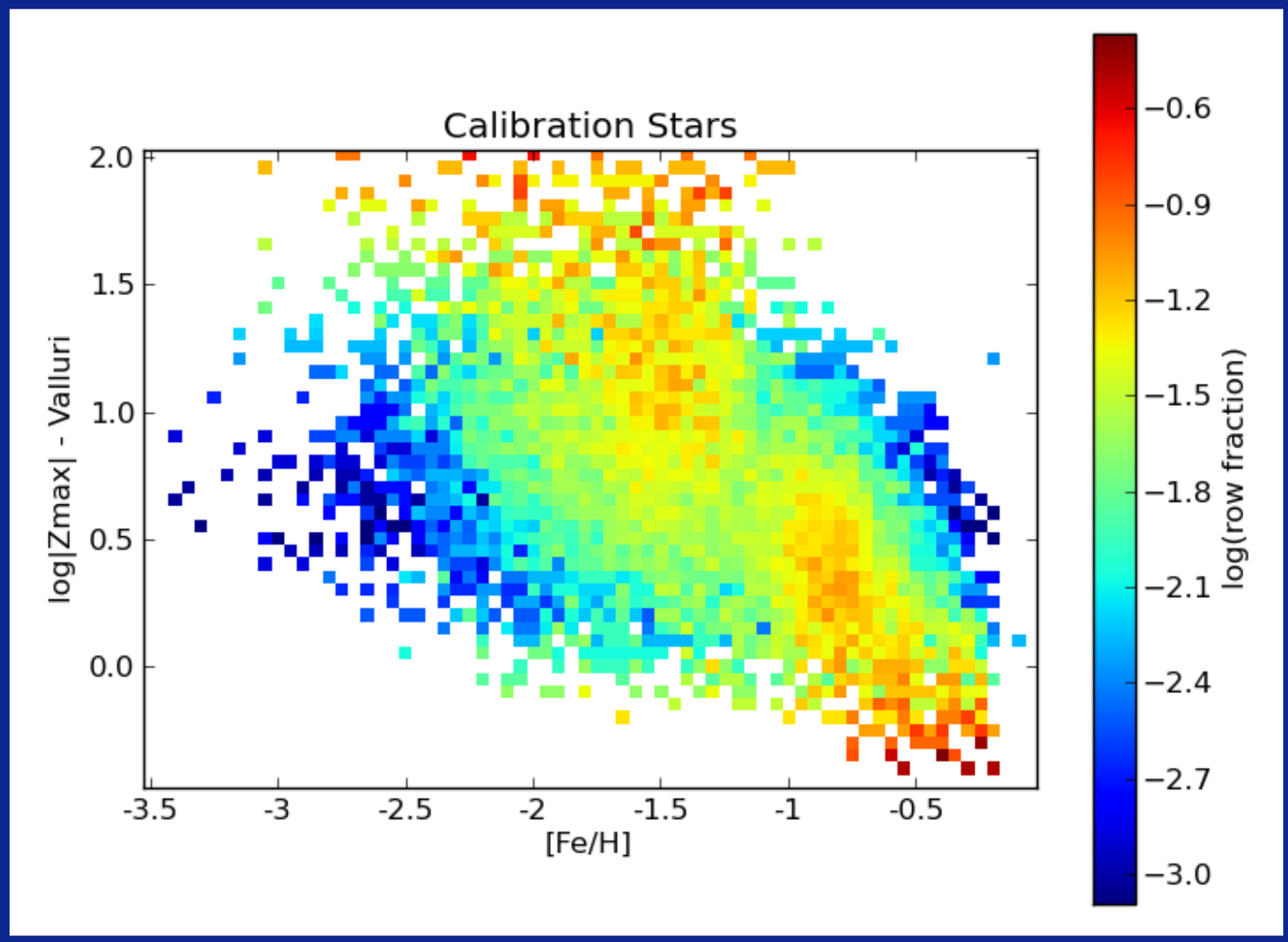
Orbital Plots



Observed vs. Dynamic



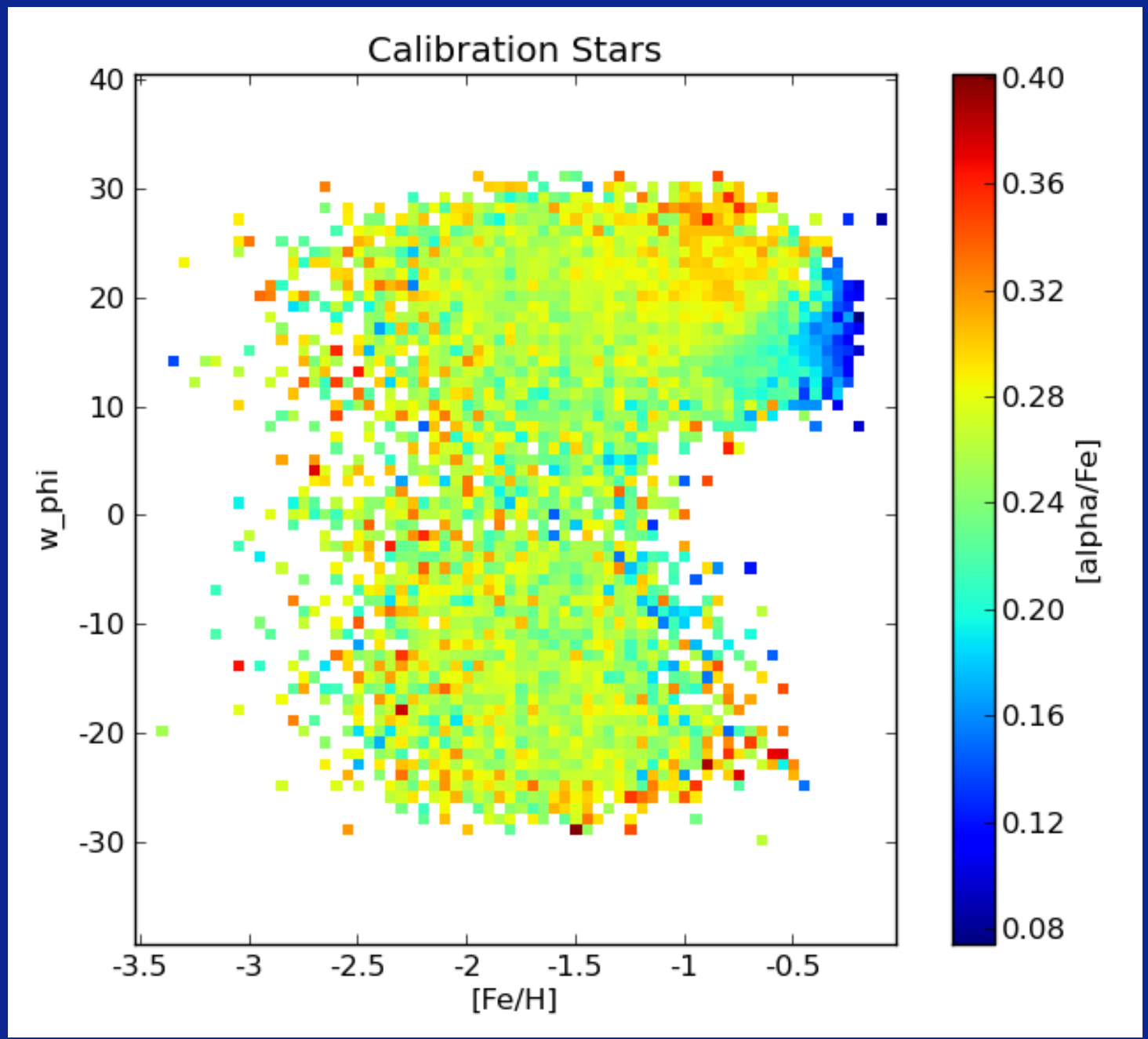
Present



Dynamic

Alpha Elements

- not a lot of differentiation in the halo
- thin/thick disk stand out
- details about formation history



Conclusions

- can model halo and disk with local sample
- may not be many outer halo stars
- resonances & groups
- work in progress
- look at orbit shapes