

# Different IMFs in Local Group Stellar Clusters

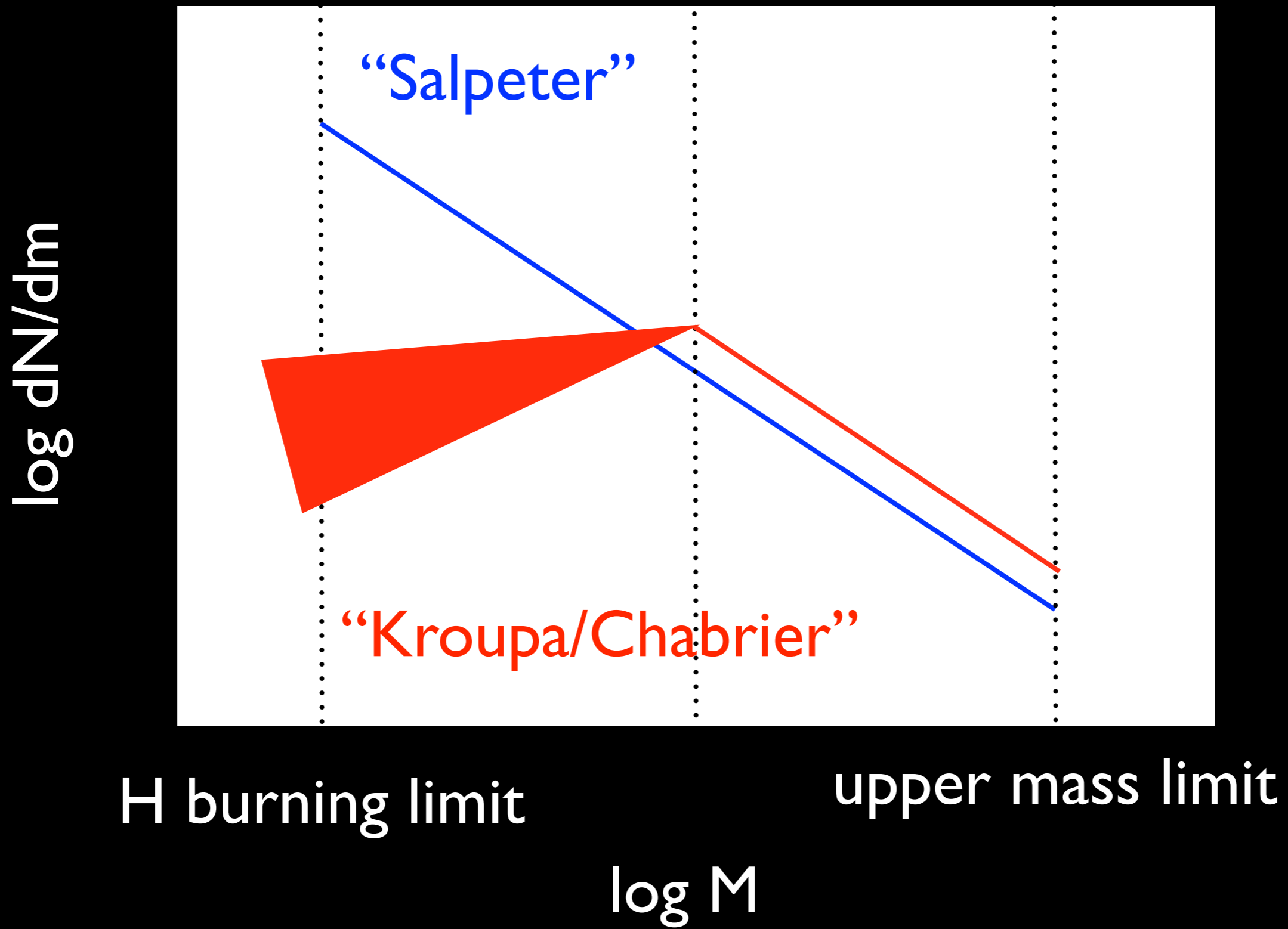
Dennis Zaritsky (U. Arizona)

Janet Colucci (Carnegie)

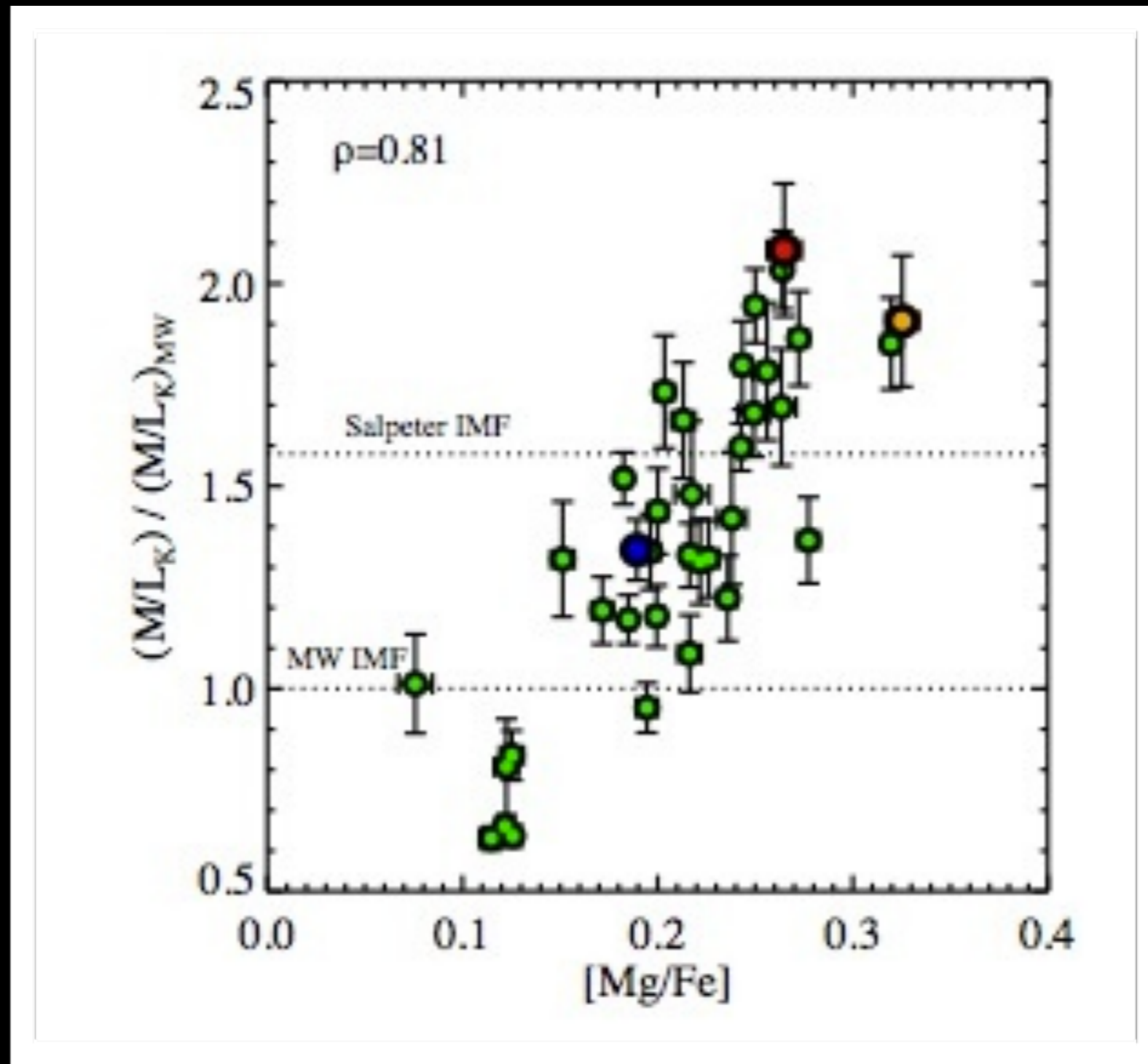
Peter Pessev (Gemini)

Rupali Chandar (U. Toledo)

Rebecca Bernstein (Carnegie/GMT)



# A Varying IMF in Early-Type Galaxies?



Conroy & van Dokkum (2011)

# Studying the IMF

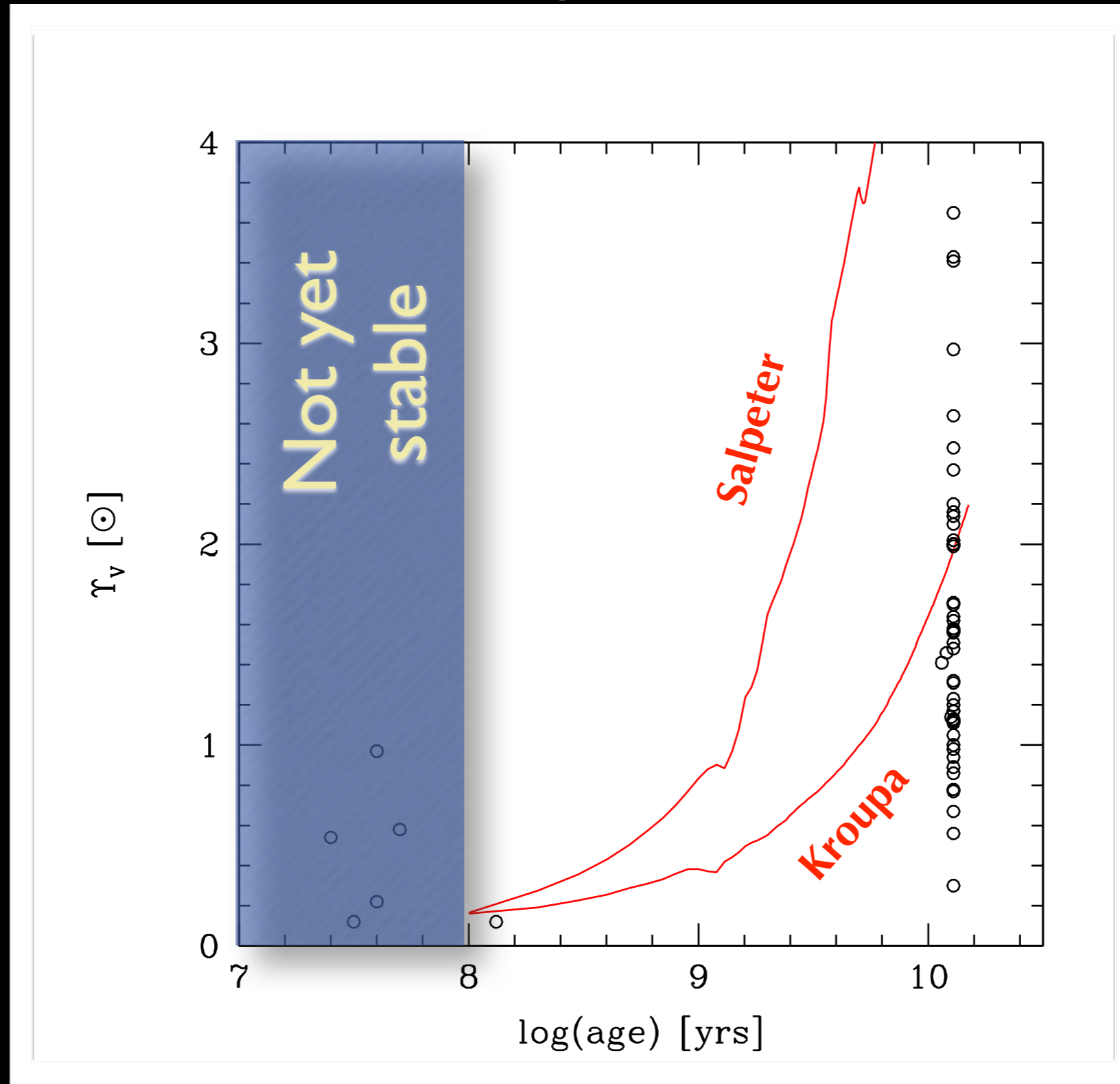
- Single age (and metallicity)
- Dark matter free
- Dynamically well behaved
- Available for a range of ages (and metallicities)

# Studying the IMF

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Local Group stellar clusters

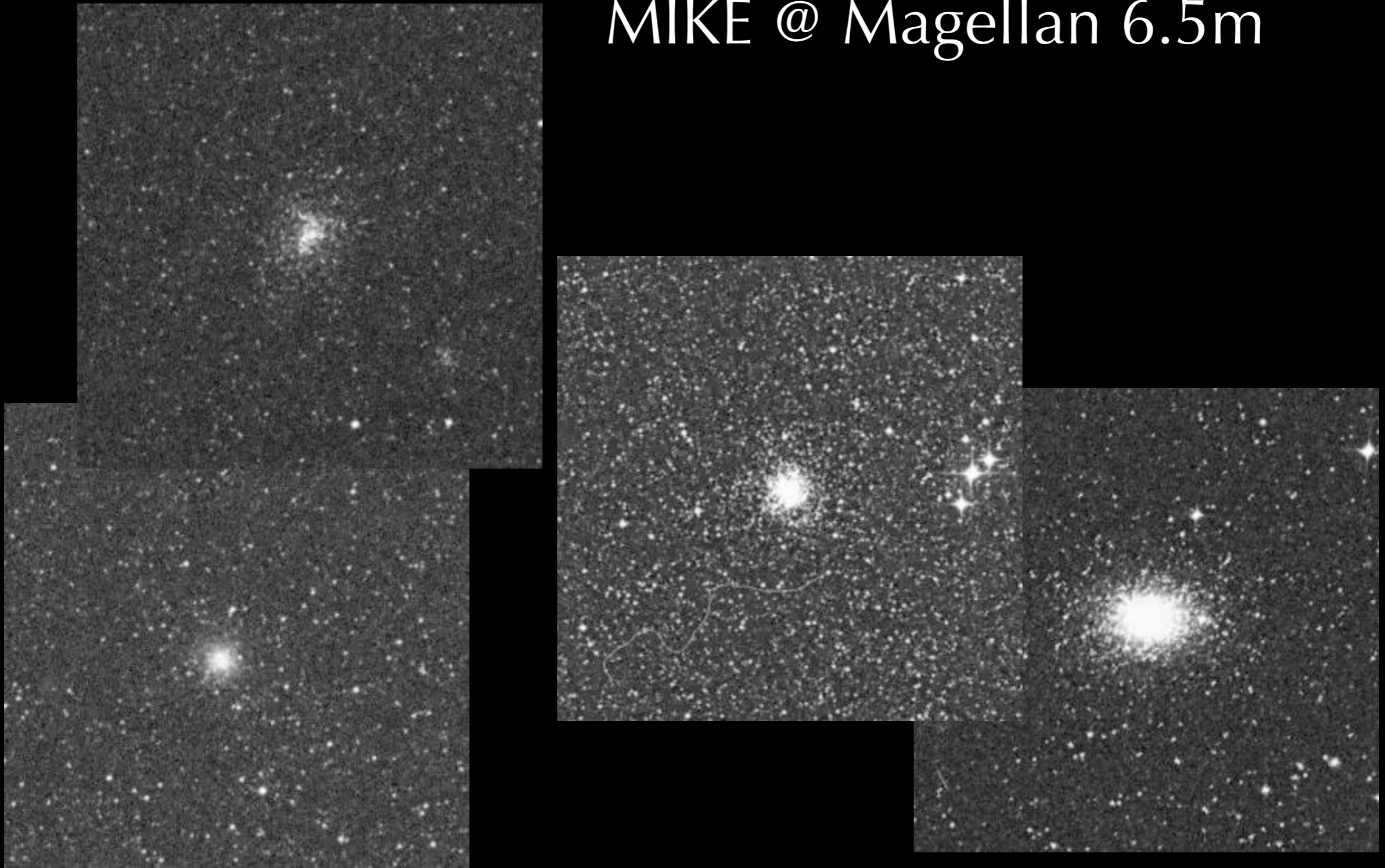
# a test with local group cluster M/L's



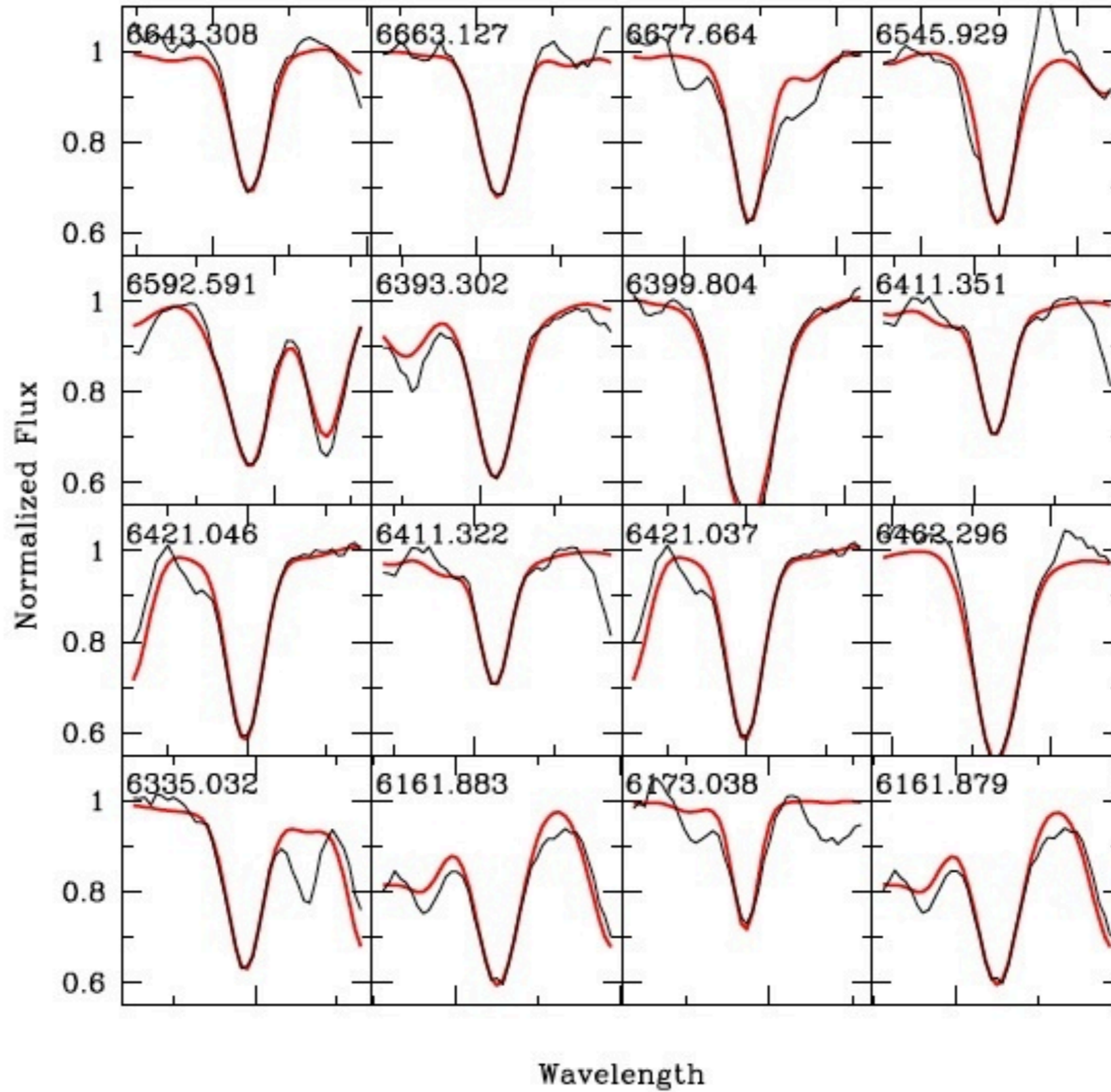
Goodwin & Bastian (2006)

McLaughlin & van der Marel (2005)

# Integrated Spectra with MIKE @ Magellan 6.5m



NGC2002:HR0805





velocity dispersion  $\xrightarrow{?}$  mass

$$X r \sigma^2 = M$$

$$M(r_h) = 580 \left( \frac{r_h}{\text{pc}} \right) \left( \frac{\sigma}{\text{km/s}} \right)^2 M_{\odot}$$

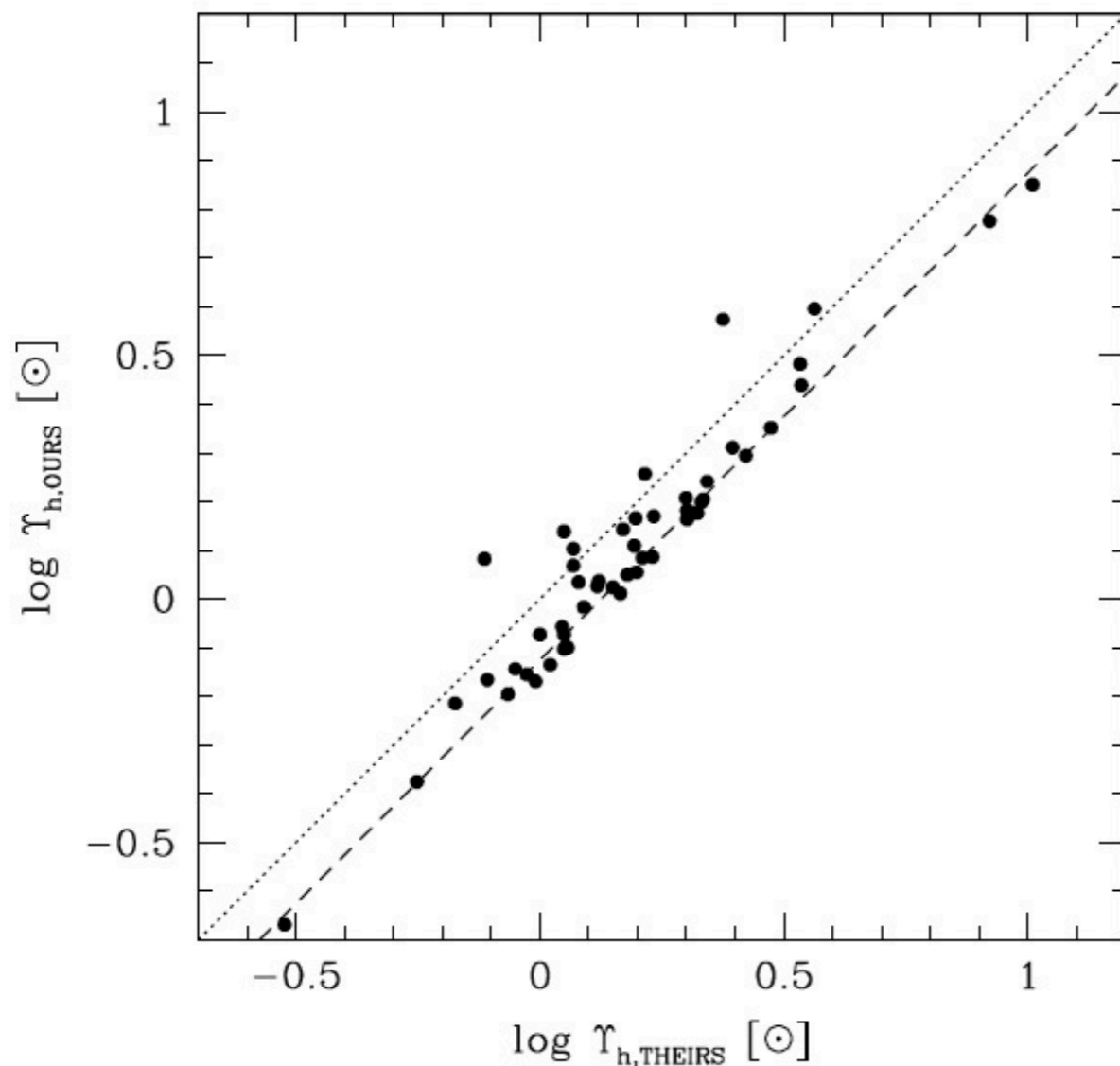
Walker et al. 2009

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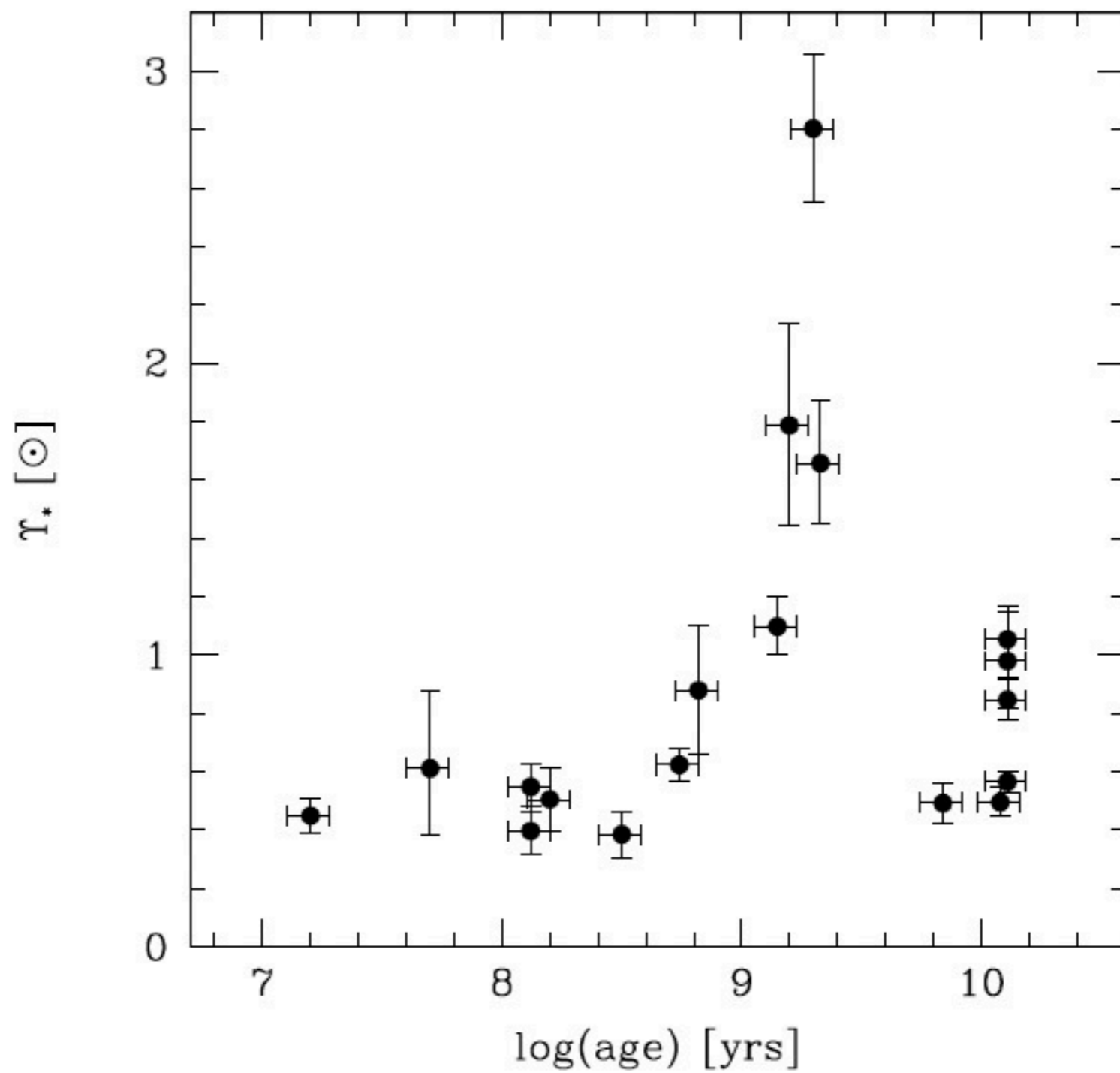
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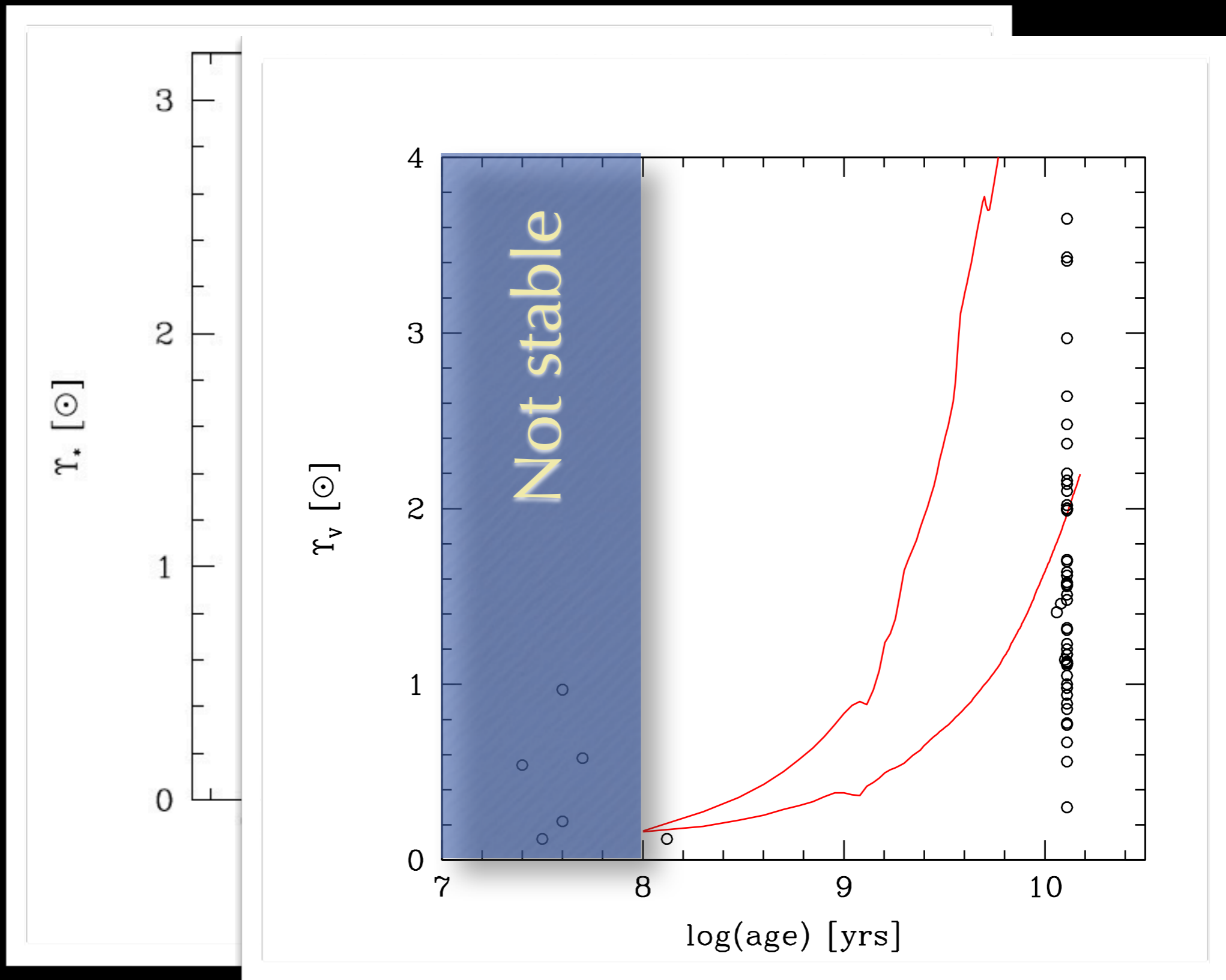


McLaughlin & van der Marel (2005)

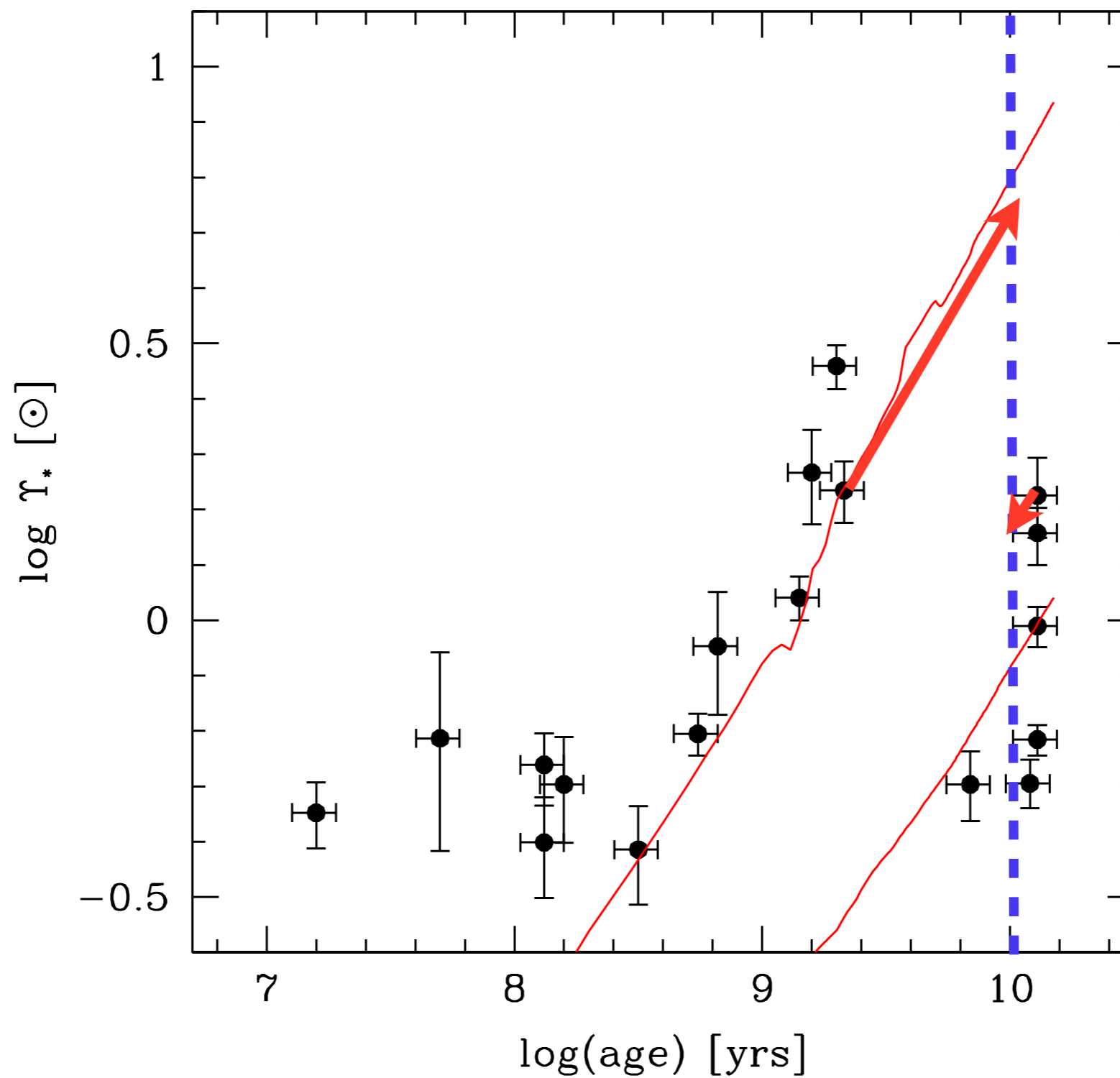
# evolution of $M/L$



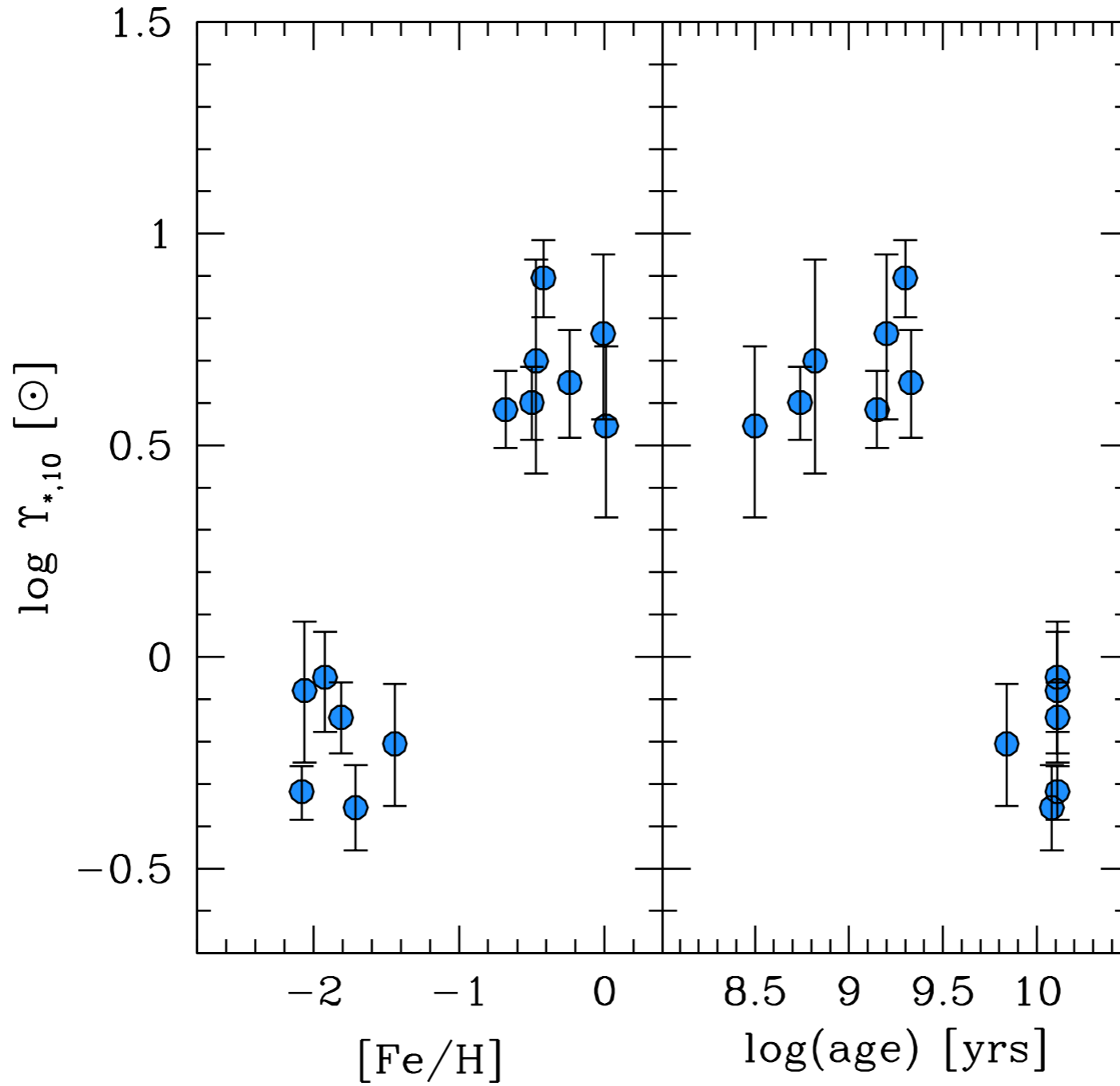
# evolution of $M/L$



# how to compare clusters

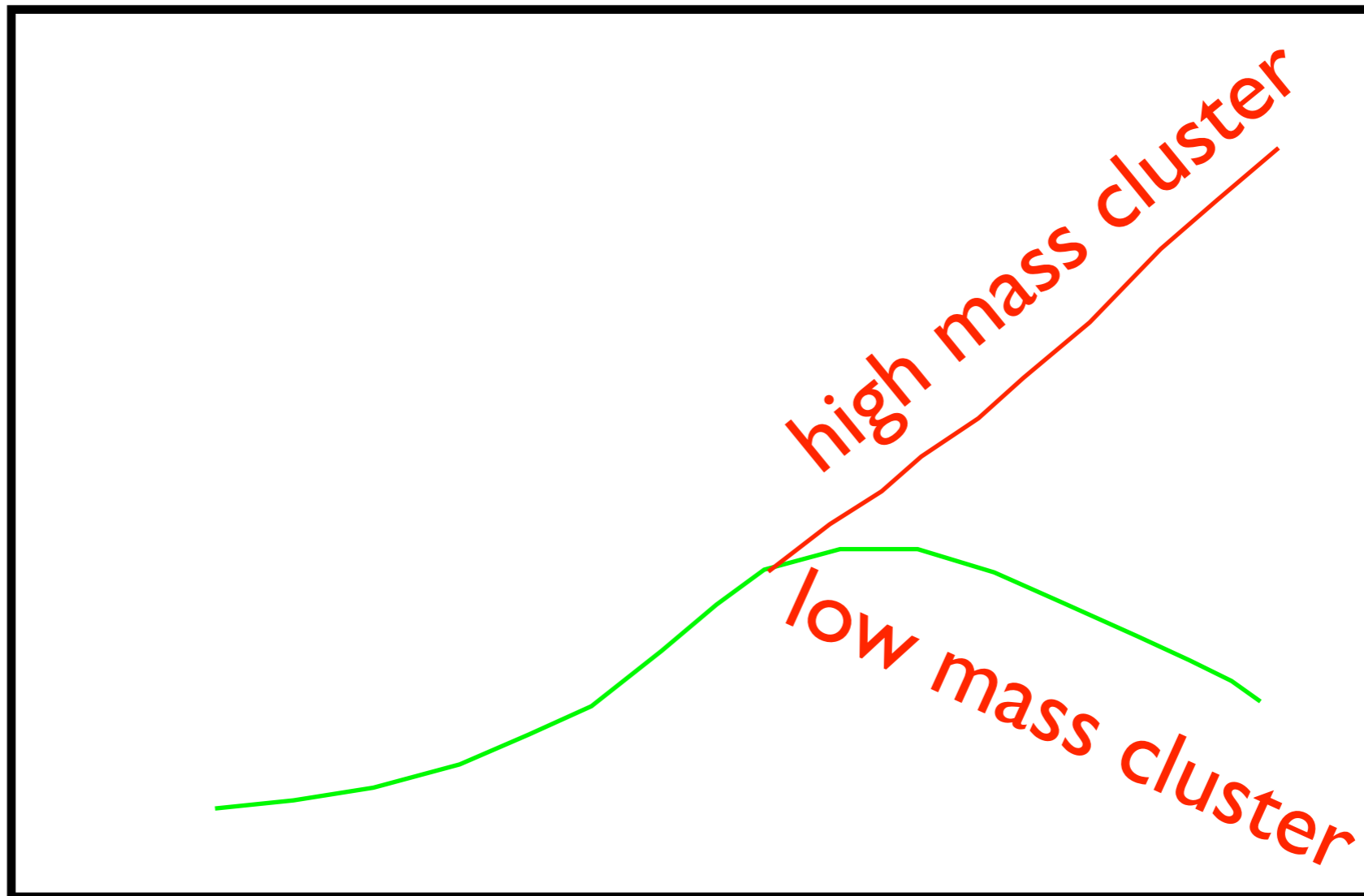


# two populations?



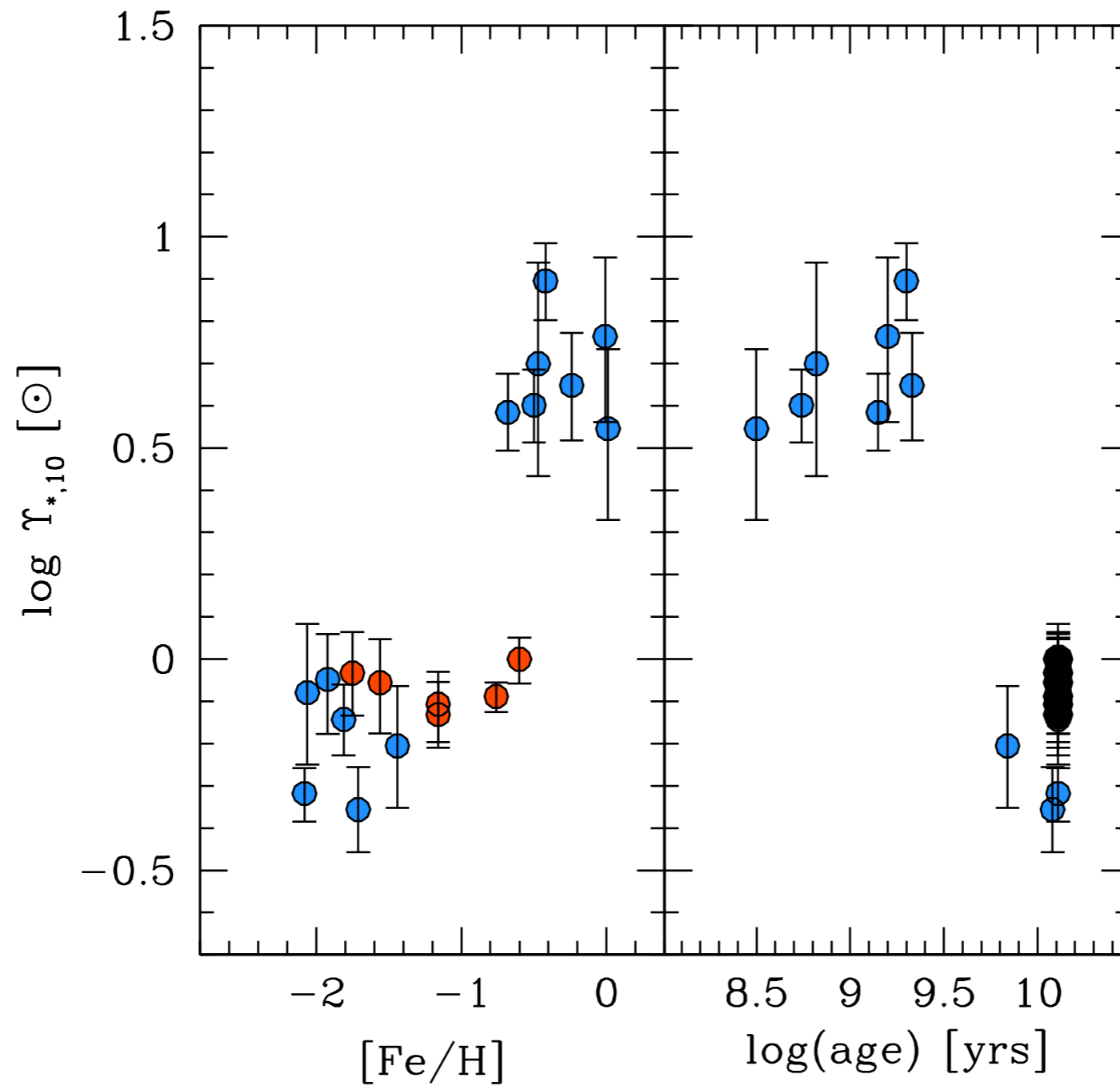
# Dynamical Evolution

M/L



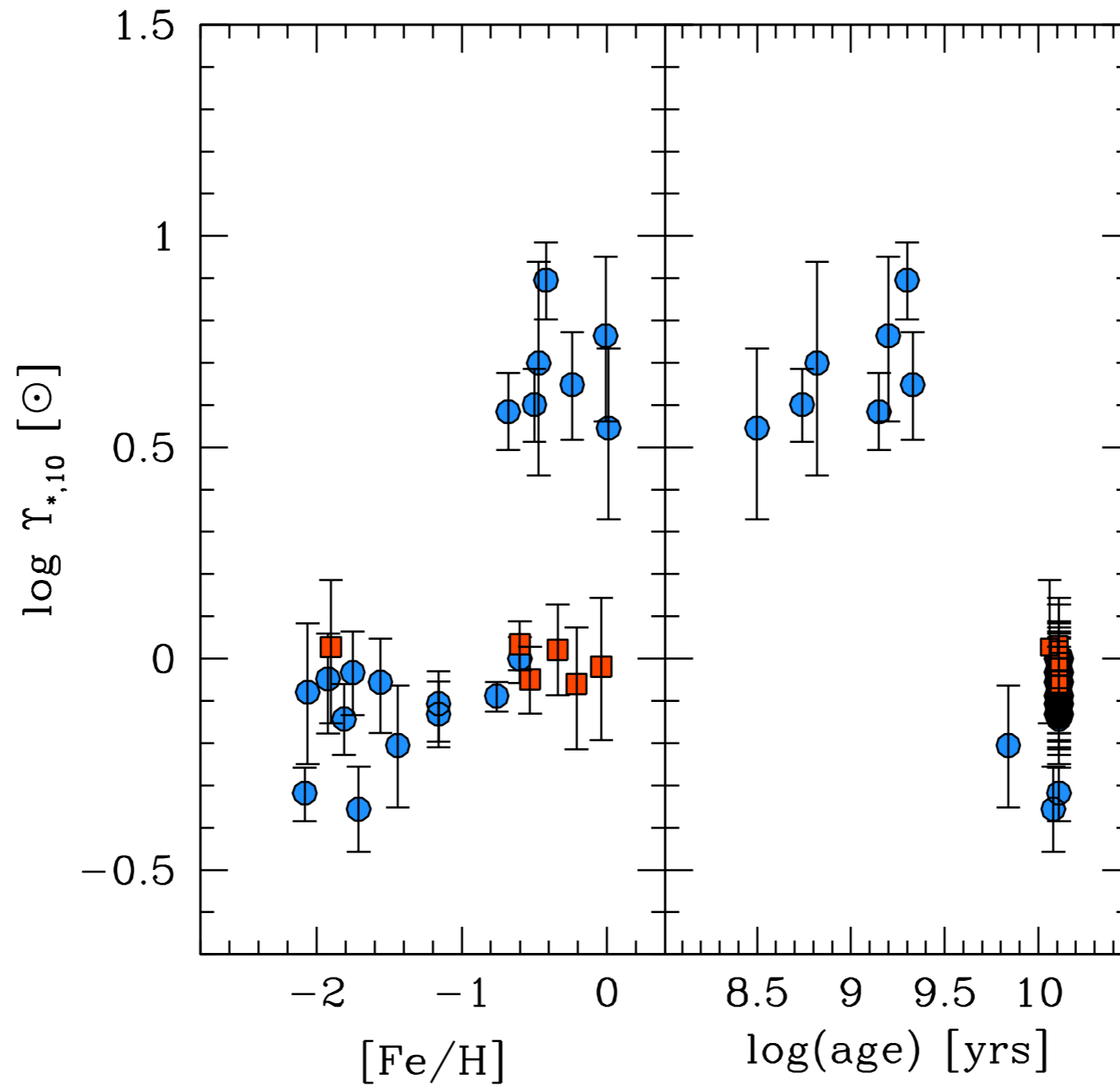
age

# two populations?



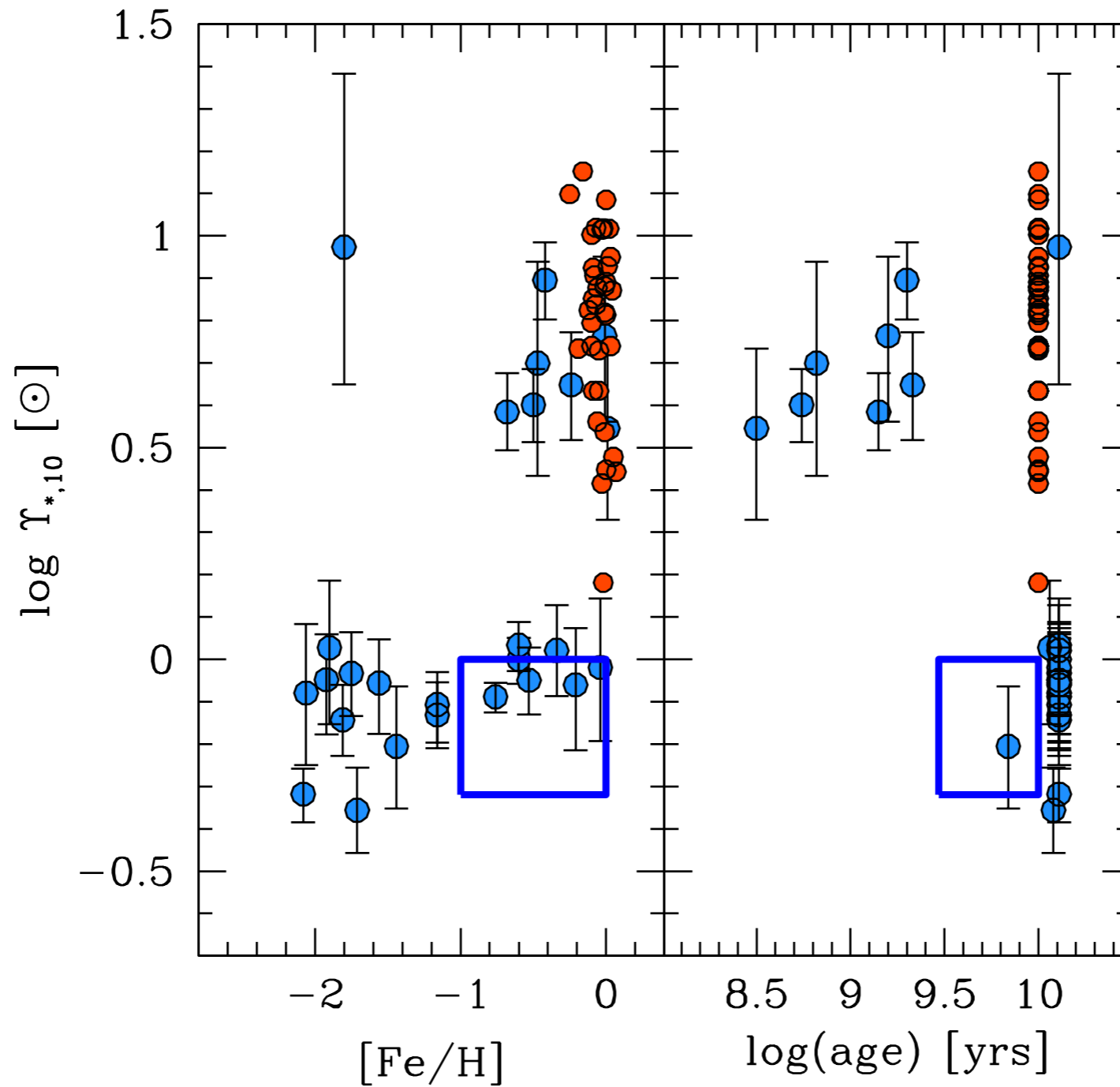


# two populations?





# two populations that matching galaxies?



elliptical from Conroy & van Dokkum (2012)

spirals from Martinsson et al. (2013)

# Summary

Independent evidence of variations in low-mass IMF

Variations found in nearby, simple stellar populations

Not driven simply by age or metallicity

# No evidence for dynamical relaxation

