

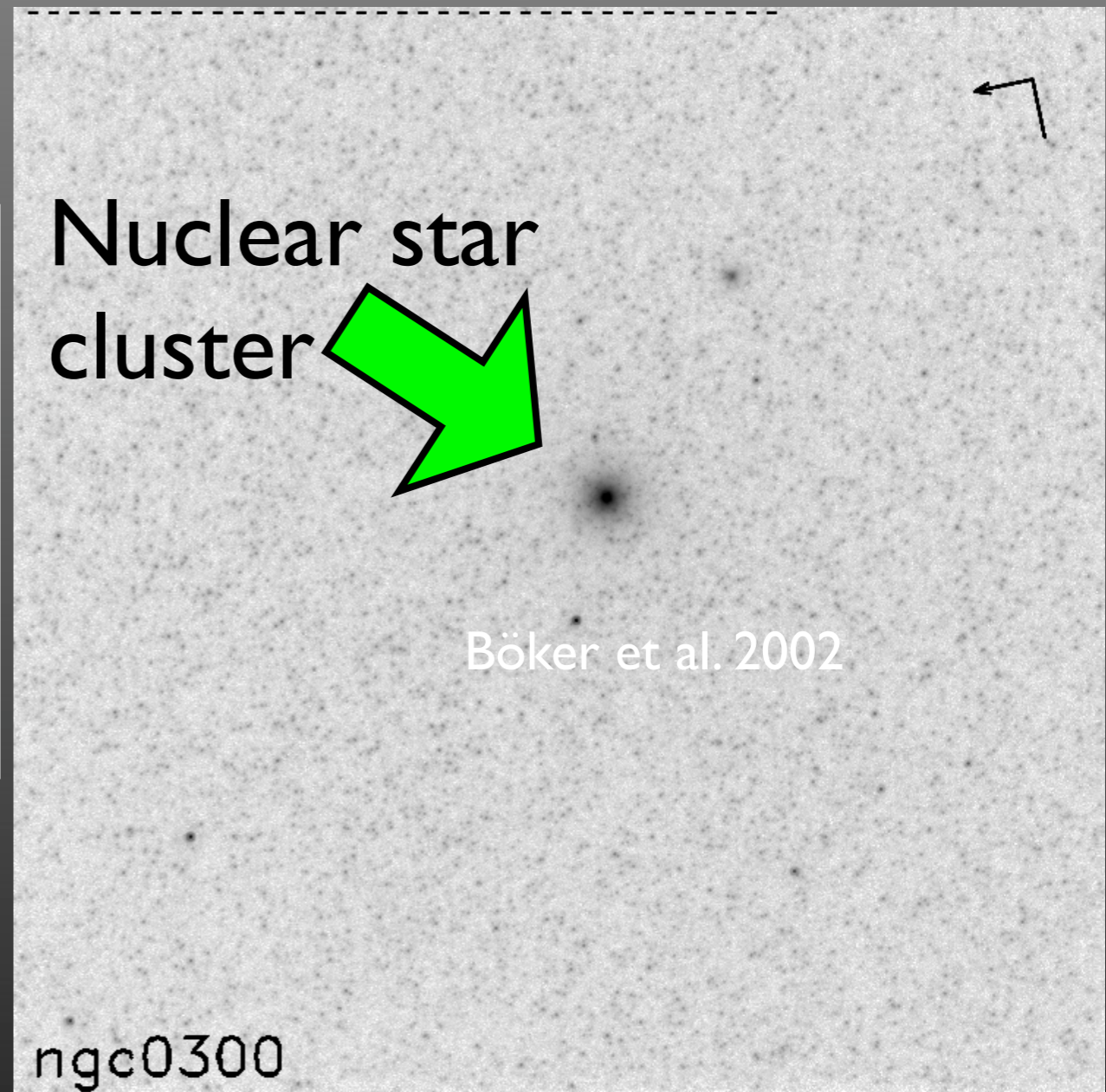
# Approaching unknown SFHs

C.J. Walcher, H.-W. Rix, T. Böker, S. Charlot, L.C. Ho,  
R. van der Marel, D. McLaughlin, N. Neumayer,  
J. Rossa, M. Sarzi, J. Shields

# Nuclear star clusters

Typical properties:

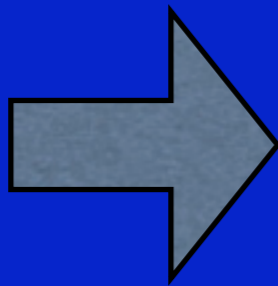
- in photometric center
- most luminous cluster by 2 mag
- $M_1 = -11.5 \pm 4$  mag
- $m_1 = 14-19.5$  mag
- $r \sim 5$  pc



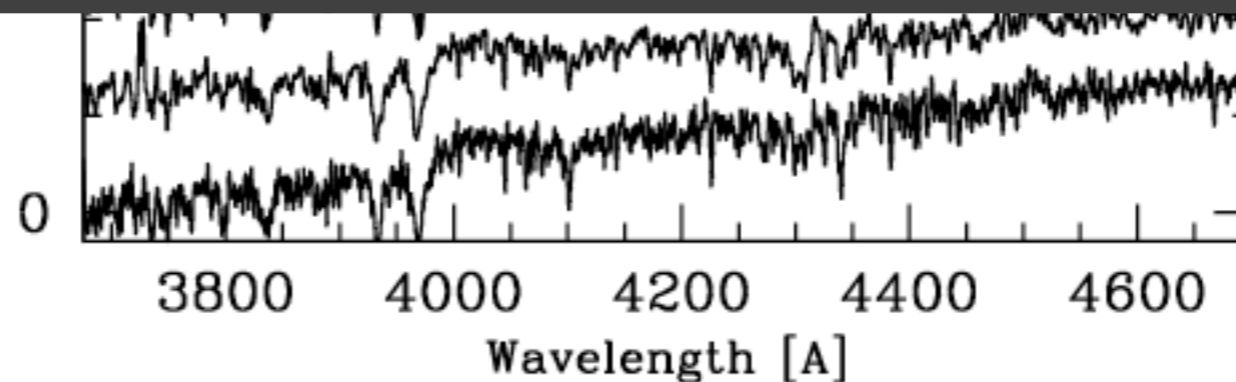
just some kind of globular??

Böker et al. 2002

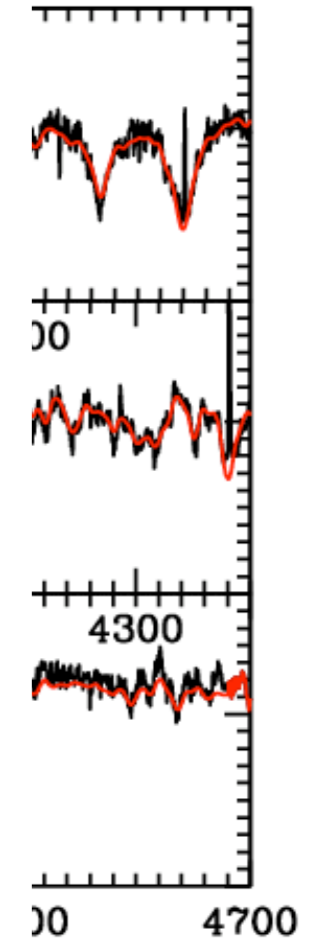
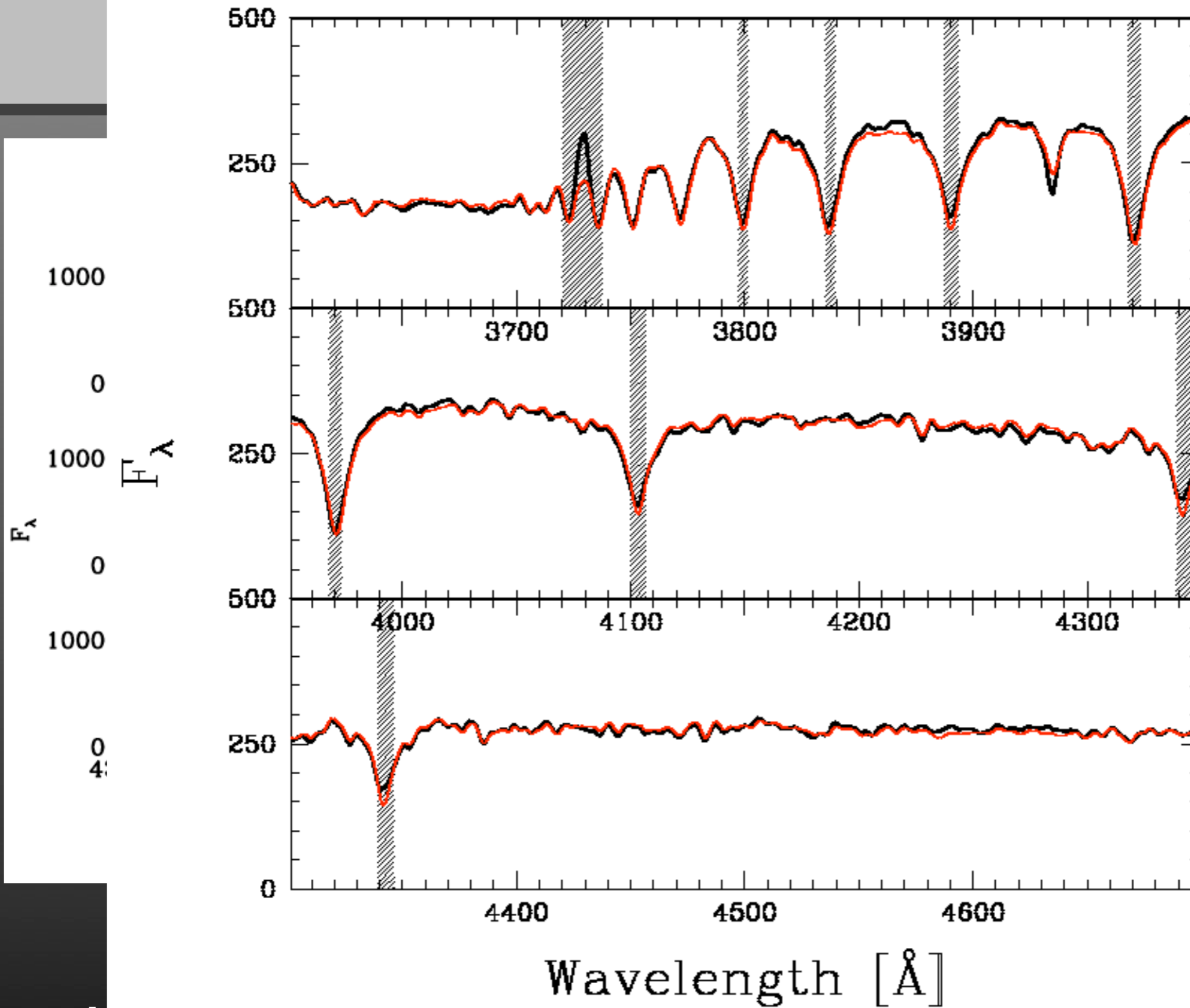
# get spectra...



VLT/UVES echelle spectra, 9 objects  
slitwidth = 1",  $R = 32000$ ,  
 $S/N \approx 20$  per  $0.07 \text{ \AA}$ ,  
 $3570\text{-}4830 \text{ \AA} + 6120\text{-}7980 \text{ \AA} + 8070\text{-}9920 \text{ \AA}$

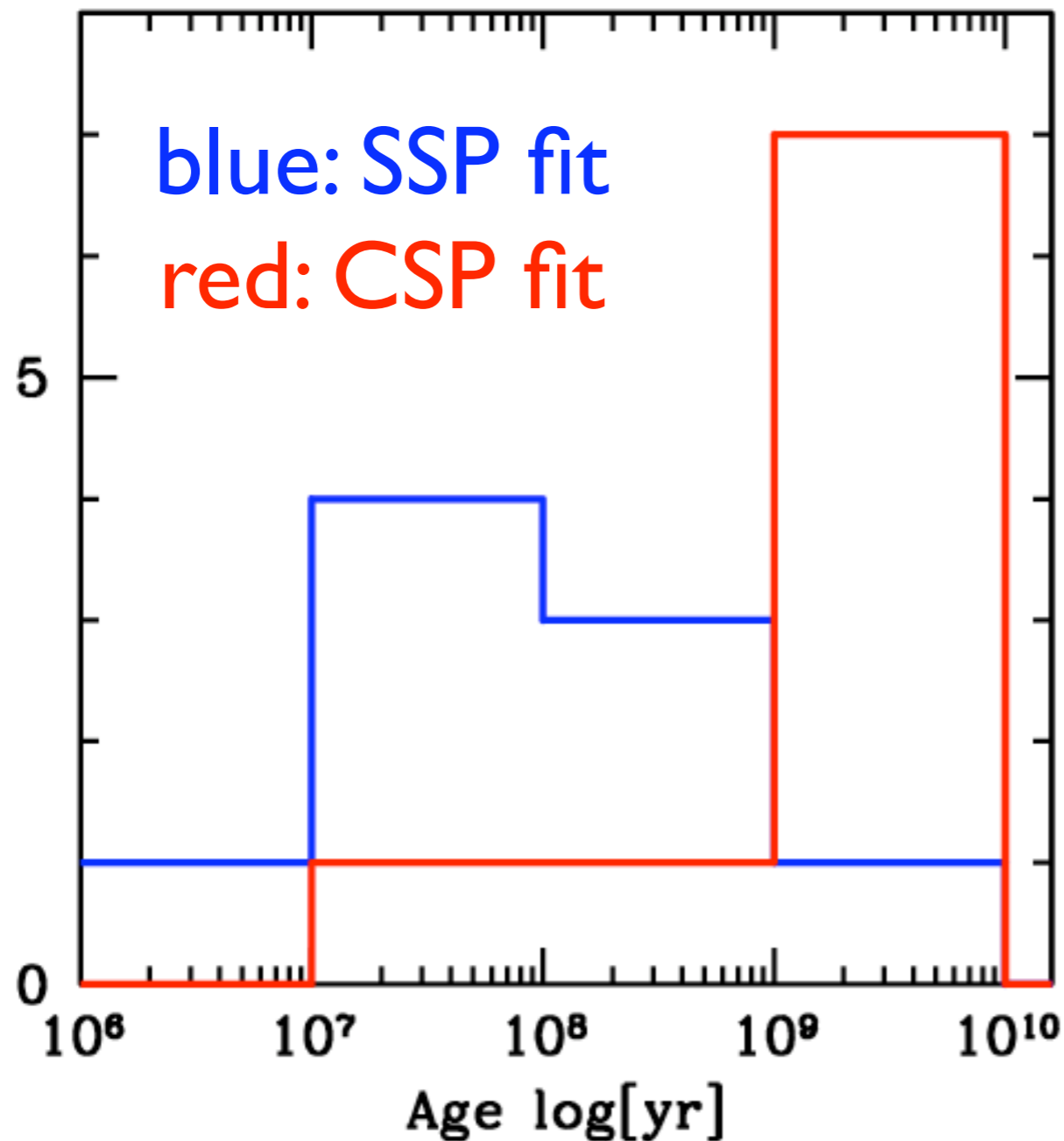


# NGC 7793



on of  
om nns

# Age Distribution

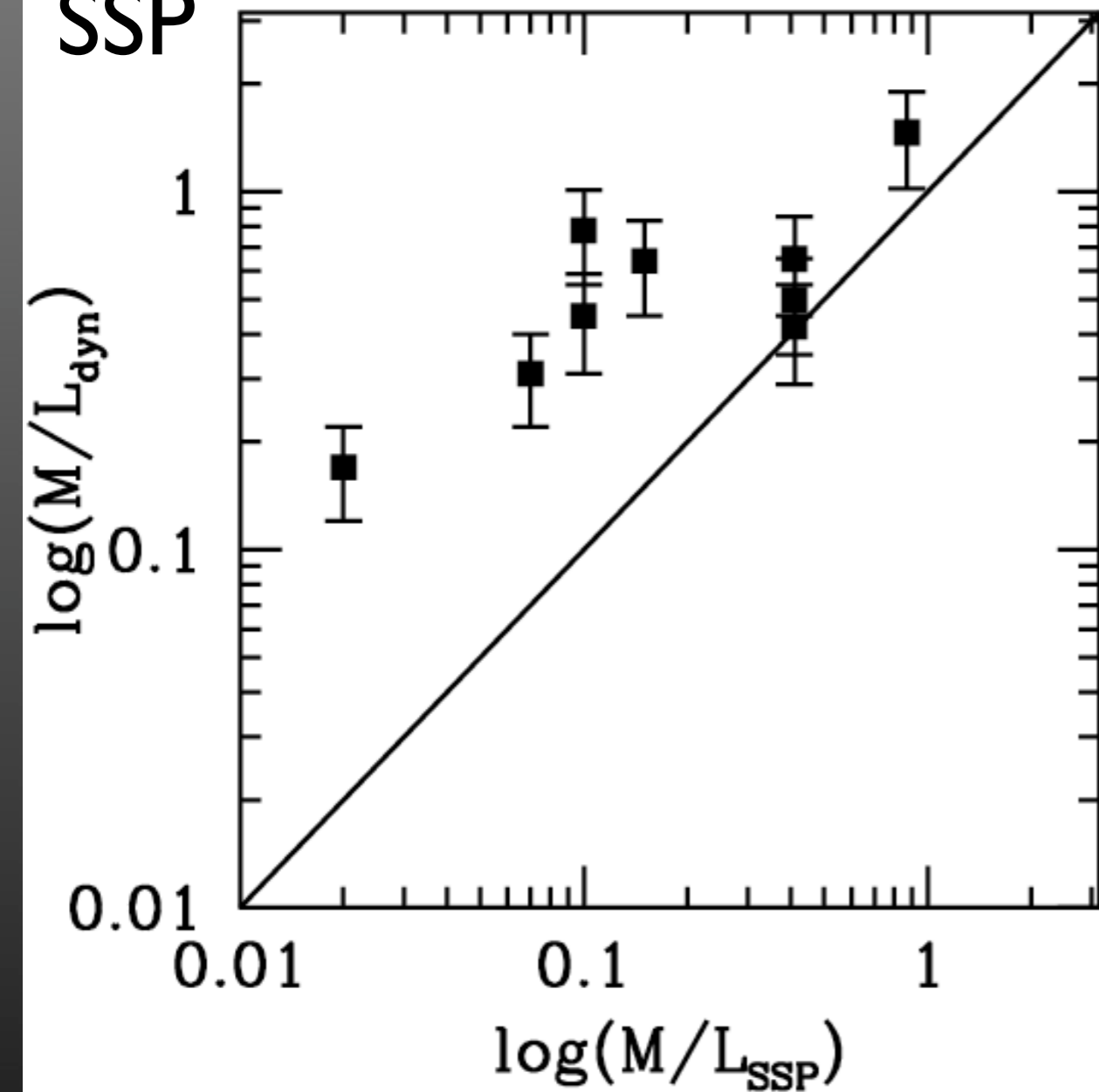


Mean lightweighted age depends strongly on method!

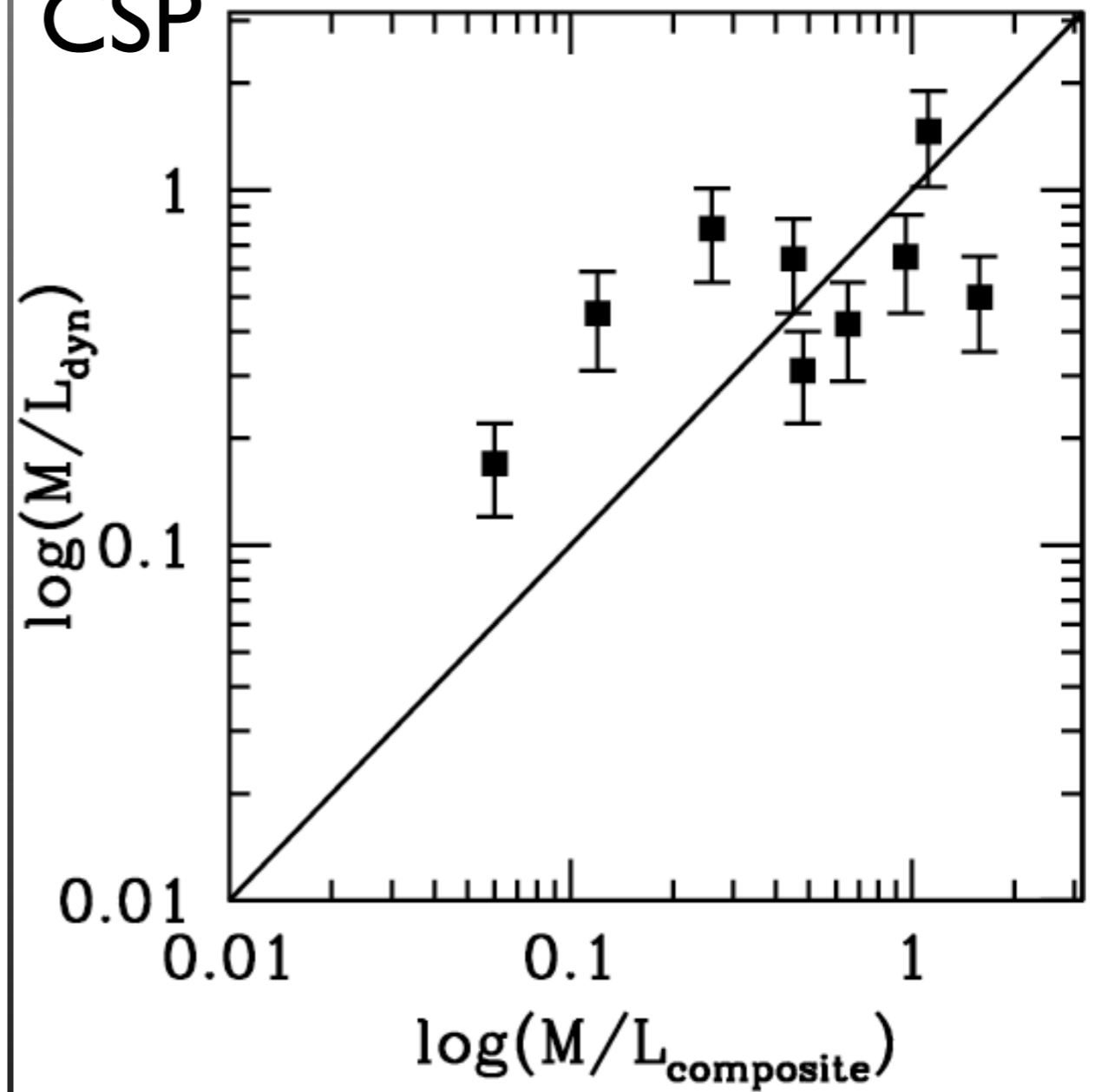
SSP:  $1 \times 10^8$  yr  
CSP:  $1 - 5 \times 10^9$  yr

# M/L

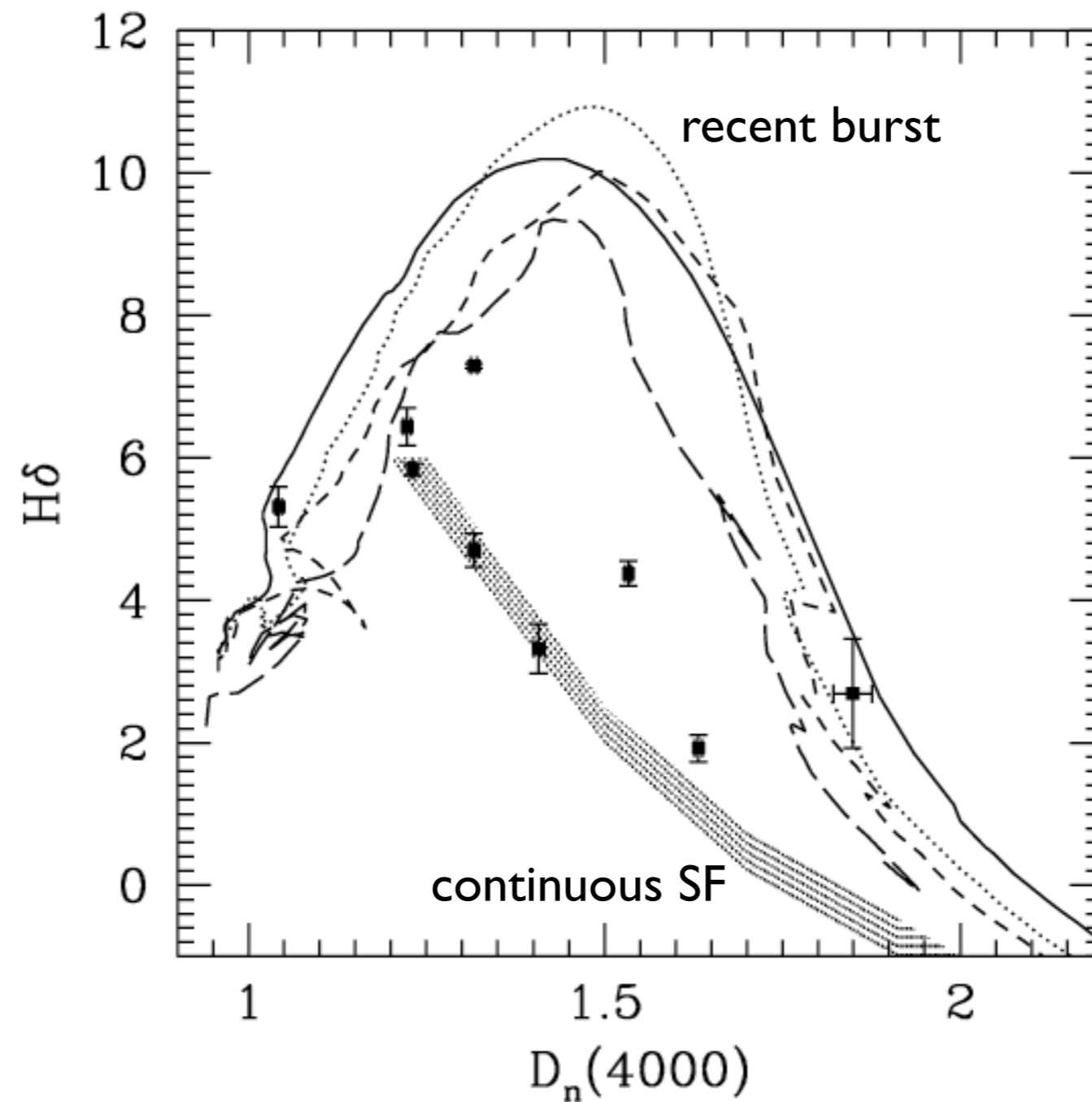
SSP



CSP

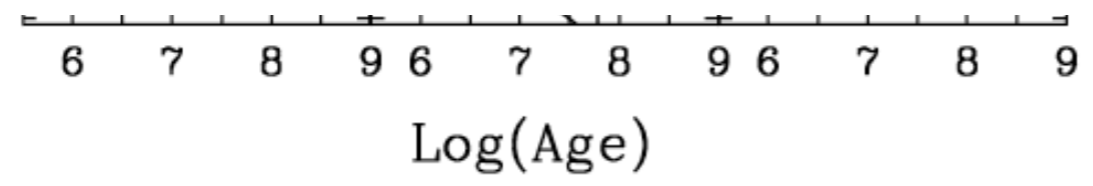
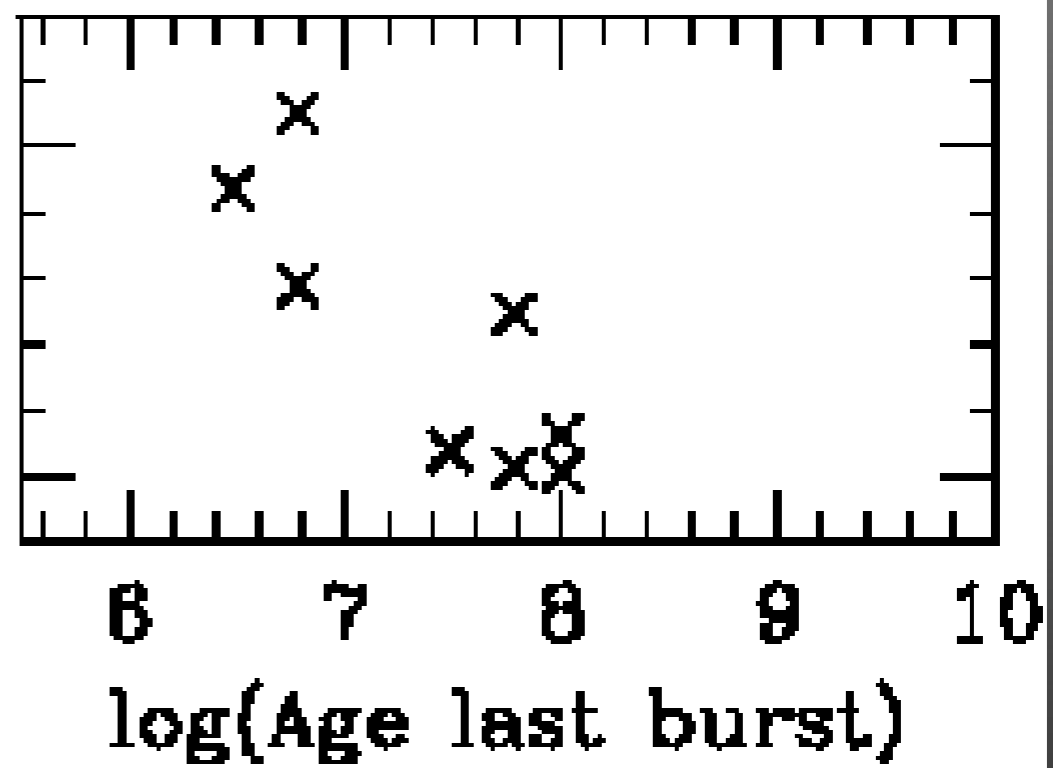
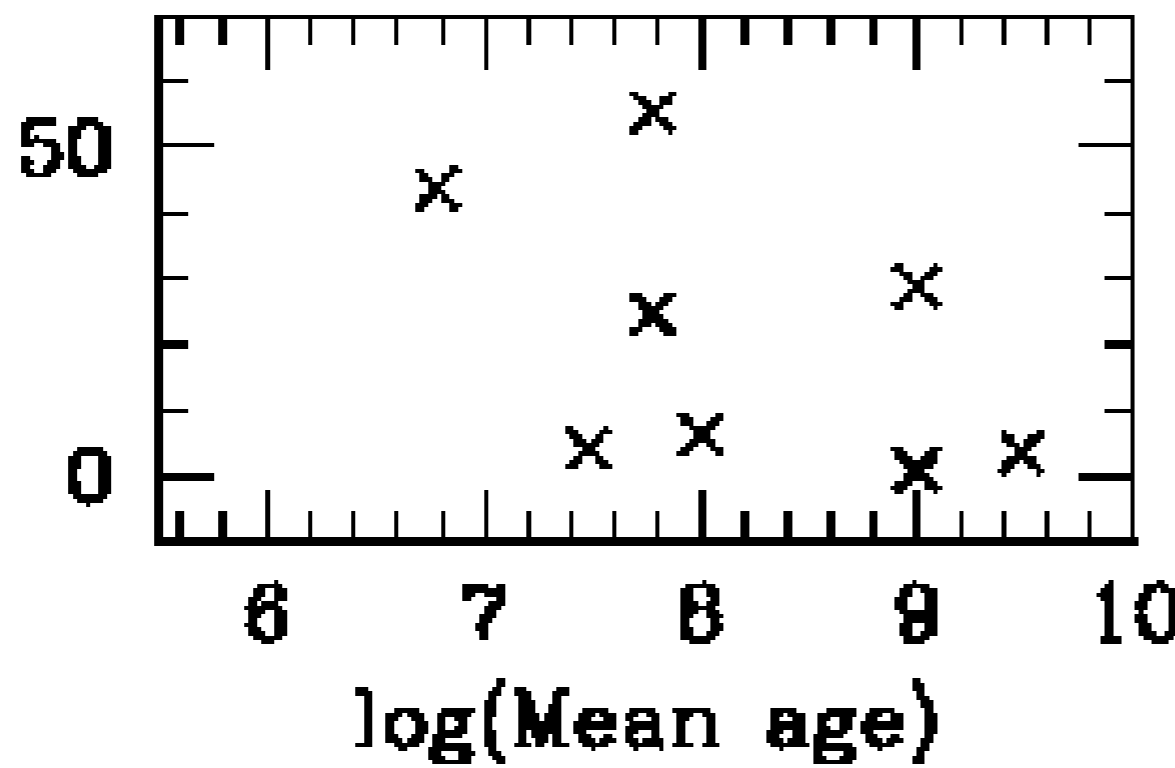
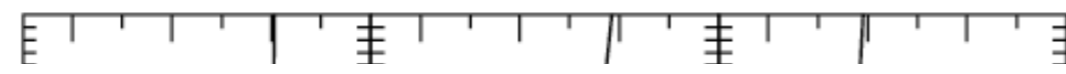


# Indices



# Last burst

EW(OII+H $\alpha$ +NII)



Log(Age)

# Conclusions

- Simple tools can lead to robust answers
- Nuclear clusters have a mean light-weighted age of

$$T_{\text{mean}} \sim 2 \times 10^9 \text{ years}$$

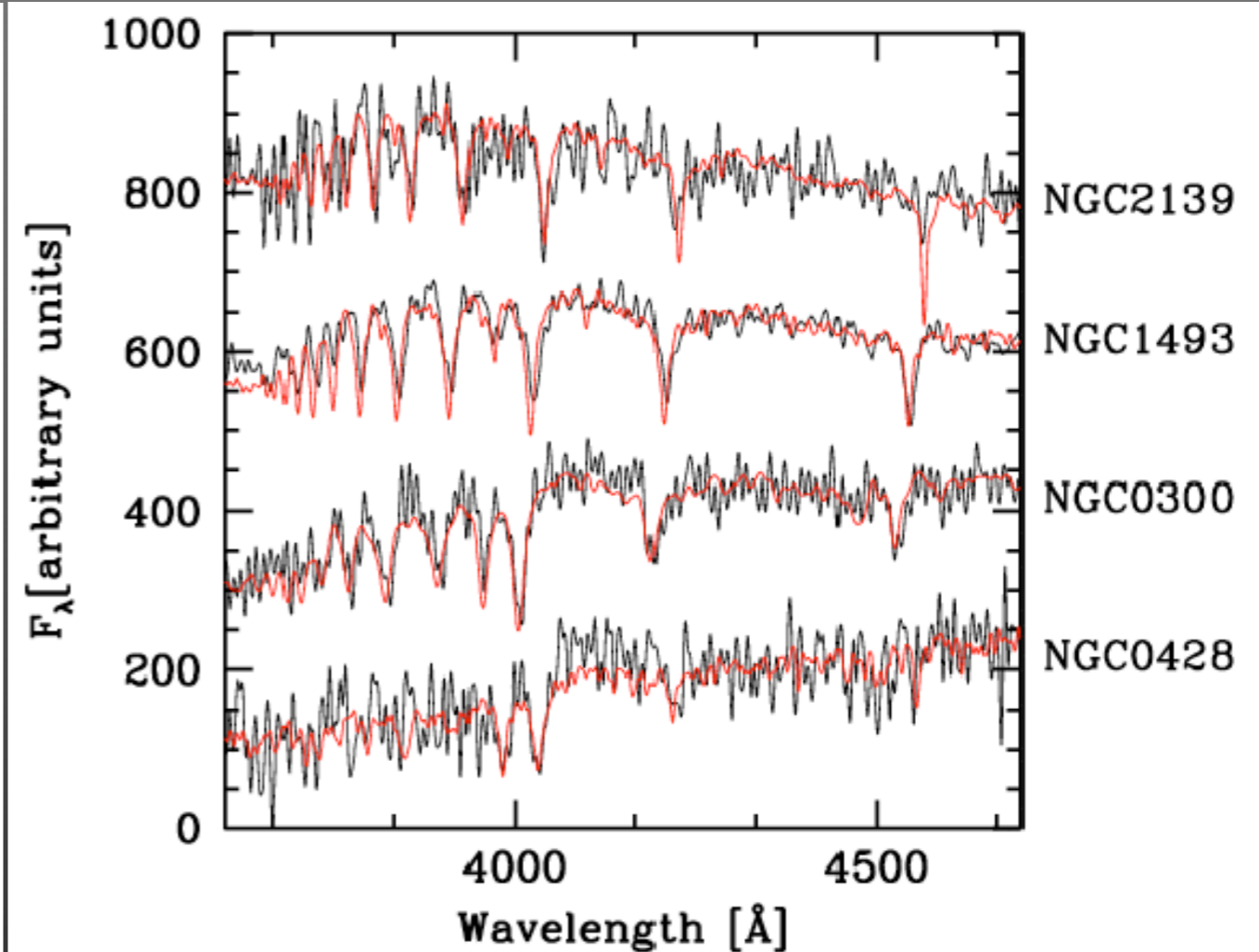
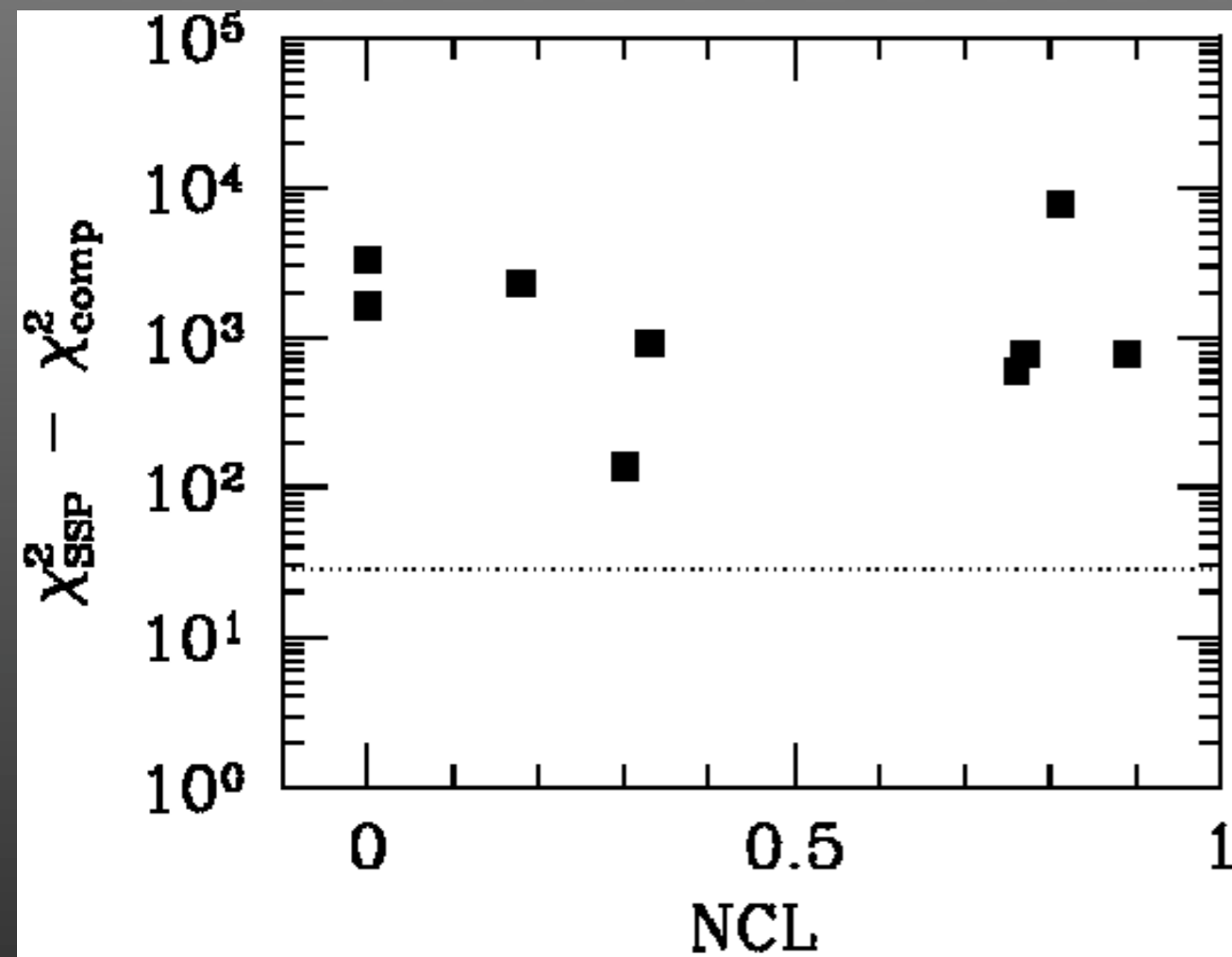
- Nuclear clusters form stars recurrently

$$\Delta T_{\text{burst}} \sim 10^8 \text{ years} \quad \Delta M \sim 2.5 \times 10^5 M_{\odot}$$

See papers Walcher et al. 2005, 2006

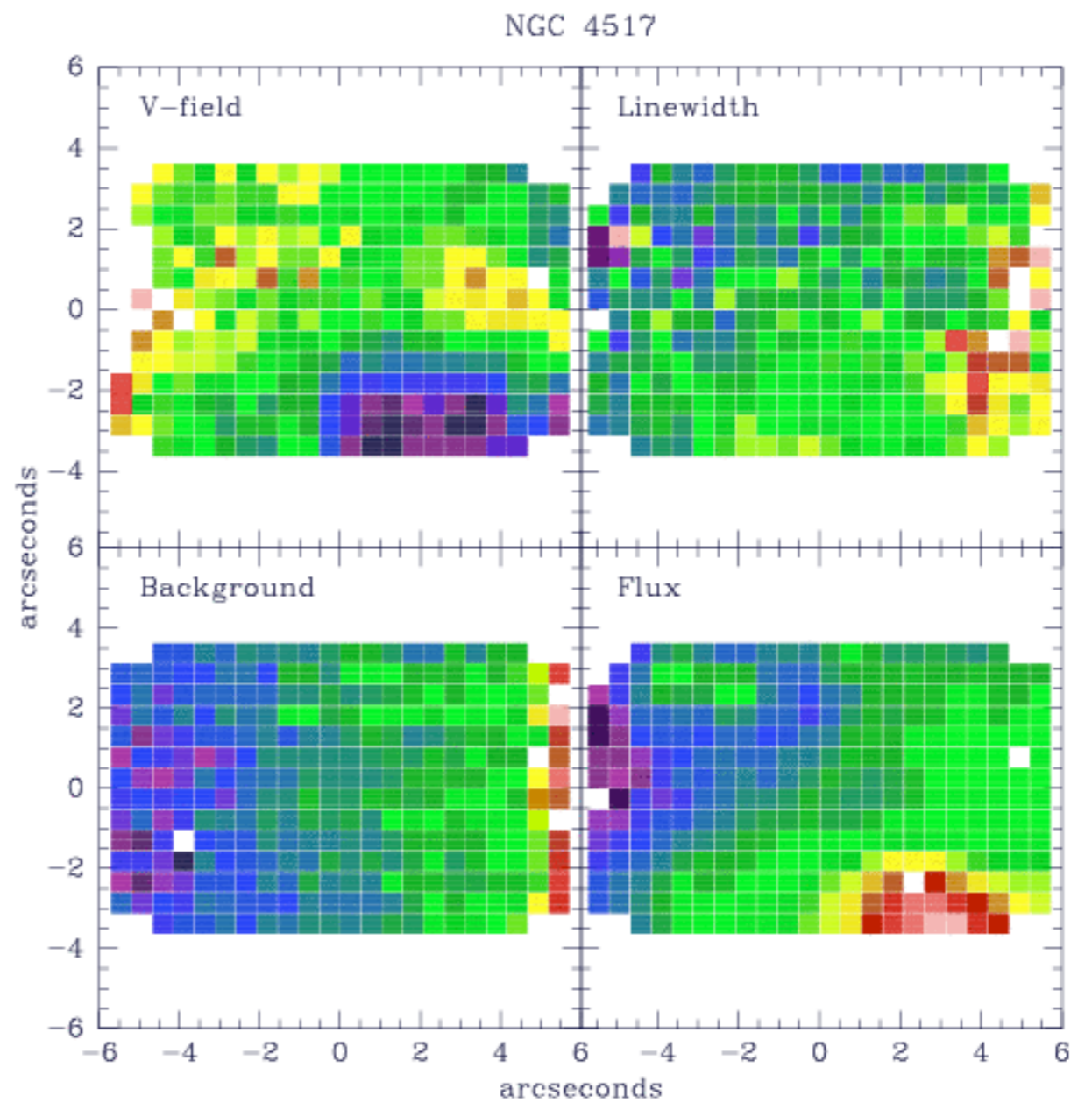
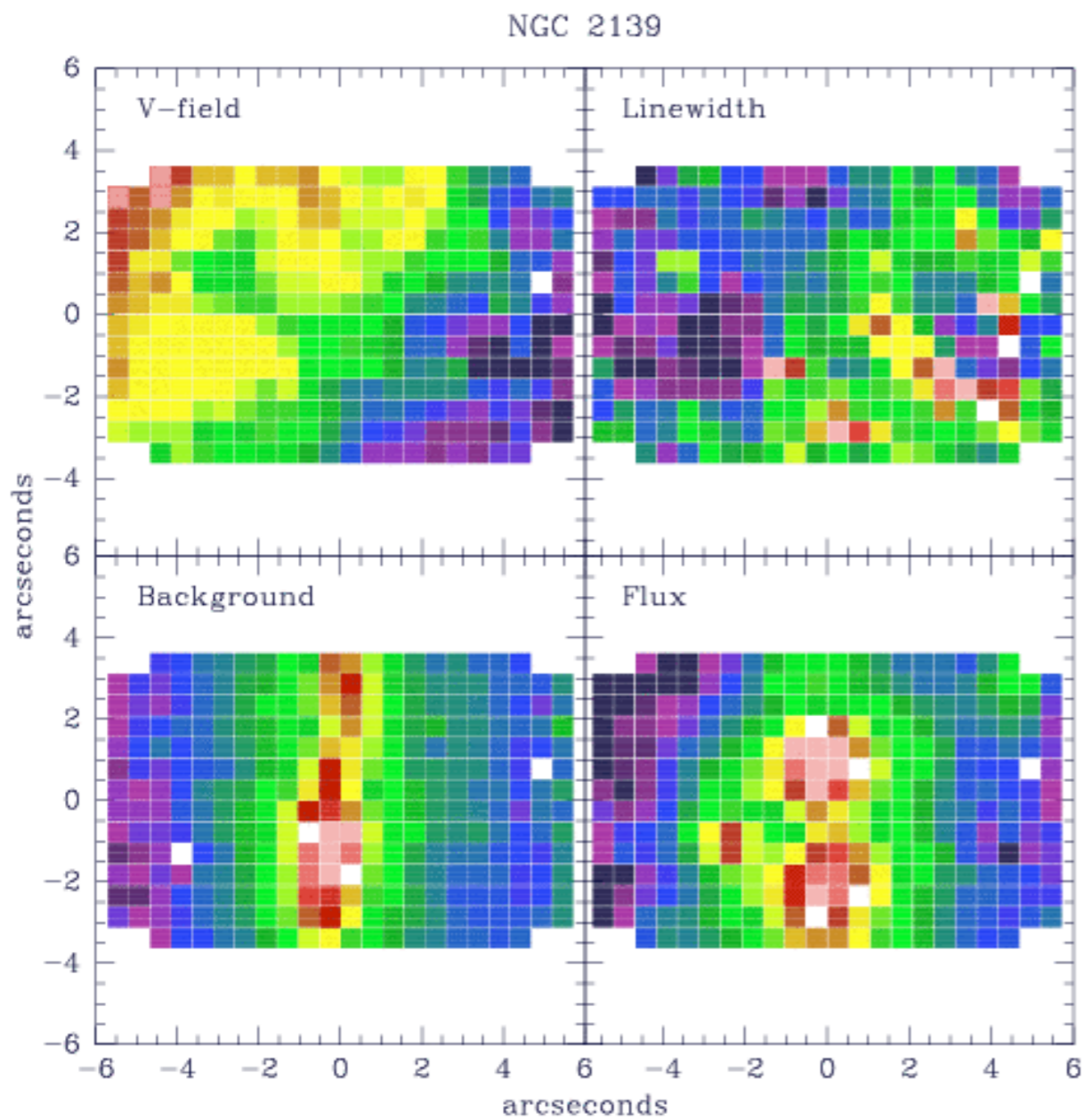
See also P. Ocvirk's talk

# Non-cluster-light



$\Delta\chi^2$  does not depend on NCL STIS 0.2" data compared to UVES 1"  
HST/STIS longslit, 4 objects, slitwidth = 0.2", R = 600, S/N = 10, 2900-5700  $\text{\AA}$

# Nuclear kinematics



Dave Andersen et al., in prep.