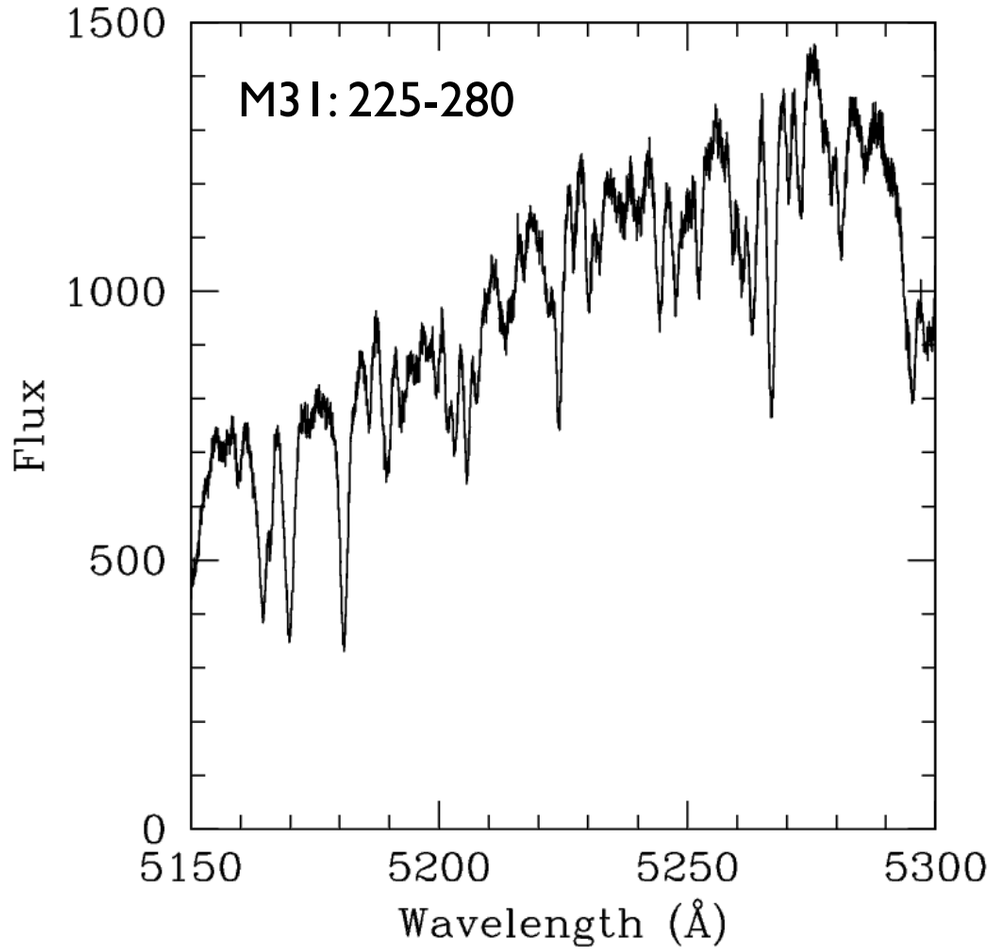
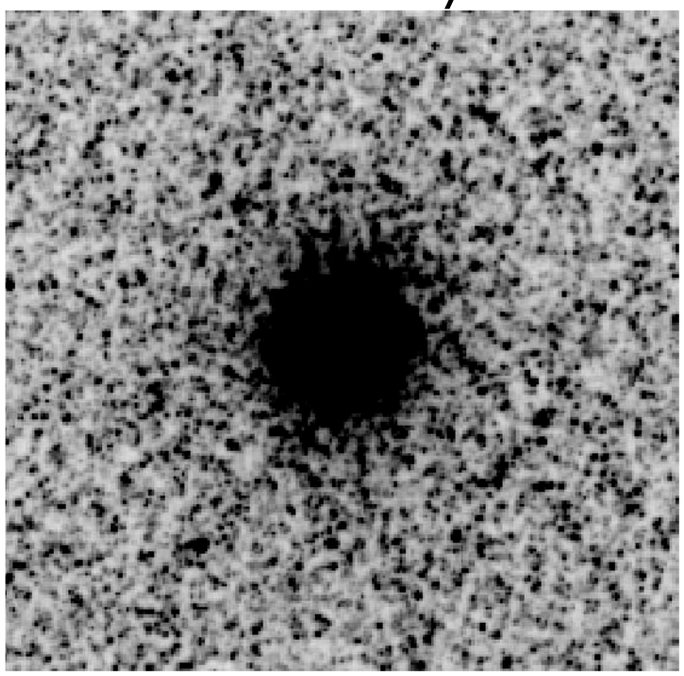
Globular Clusters in M31: Velocity Dispersions and Mass-to-Light Ratios

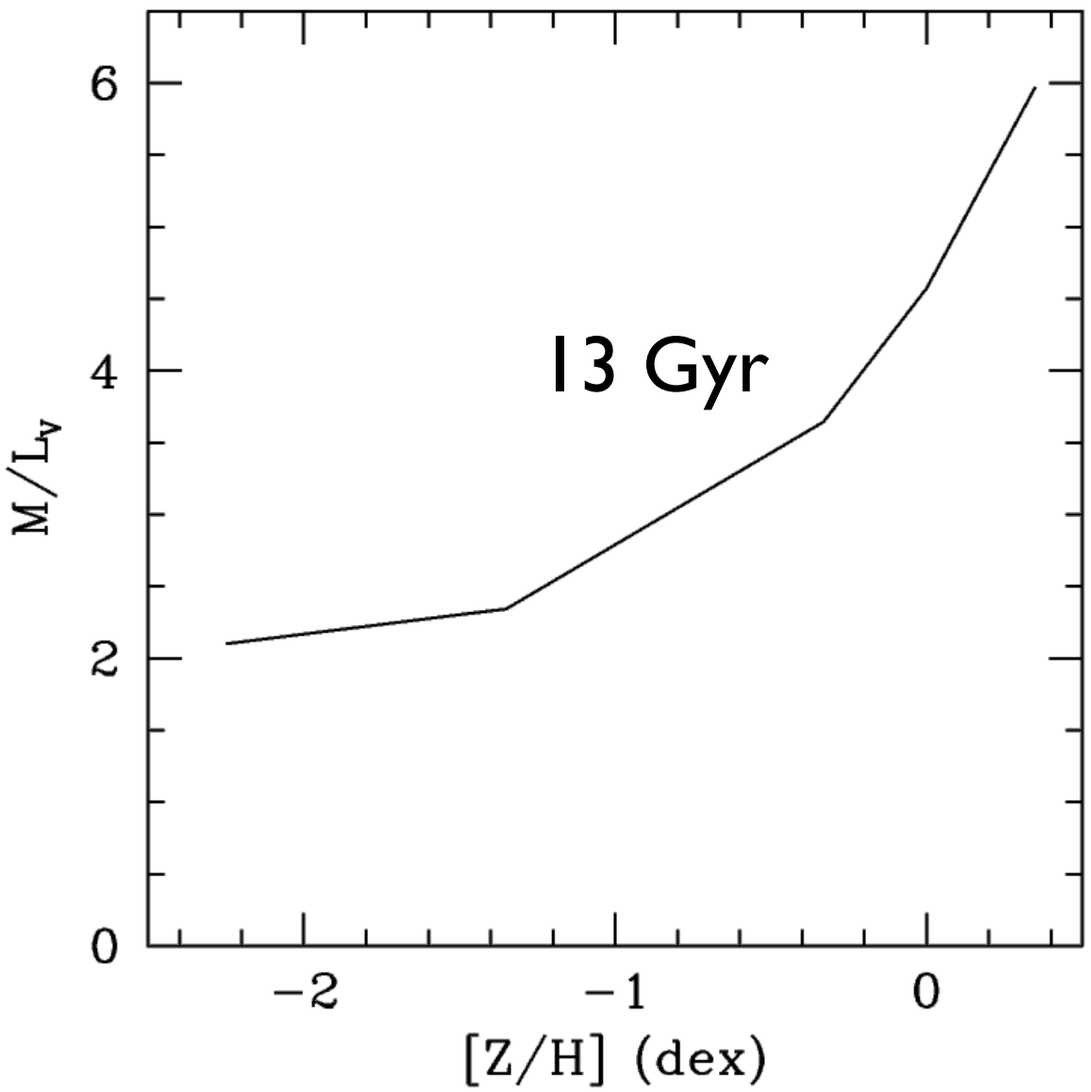
Jay Strader (with Nelson Caldwell)

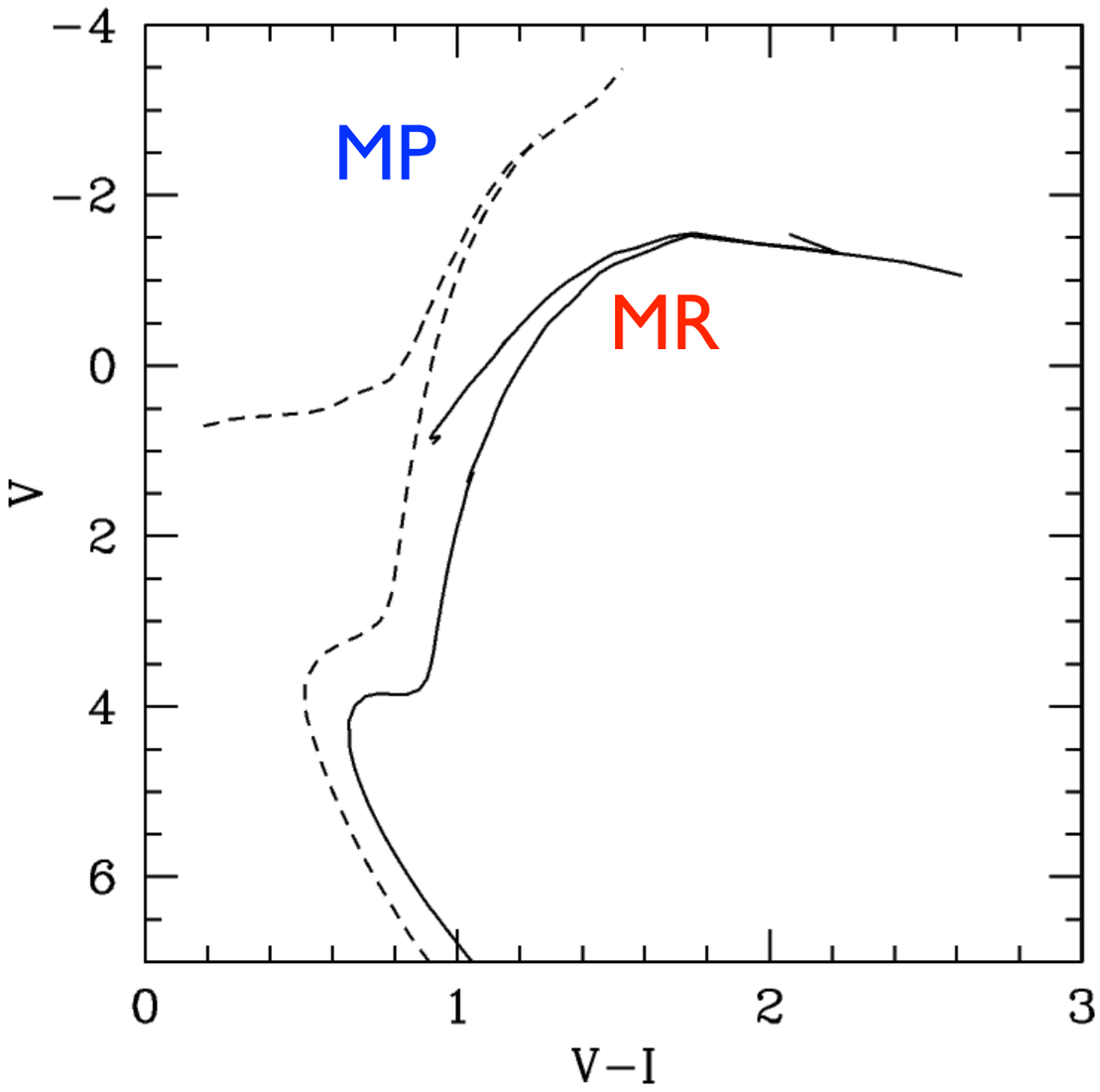


Barmby et al 2007



Mass-to-Light and [Fe/H]





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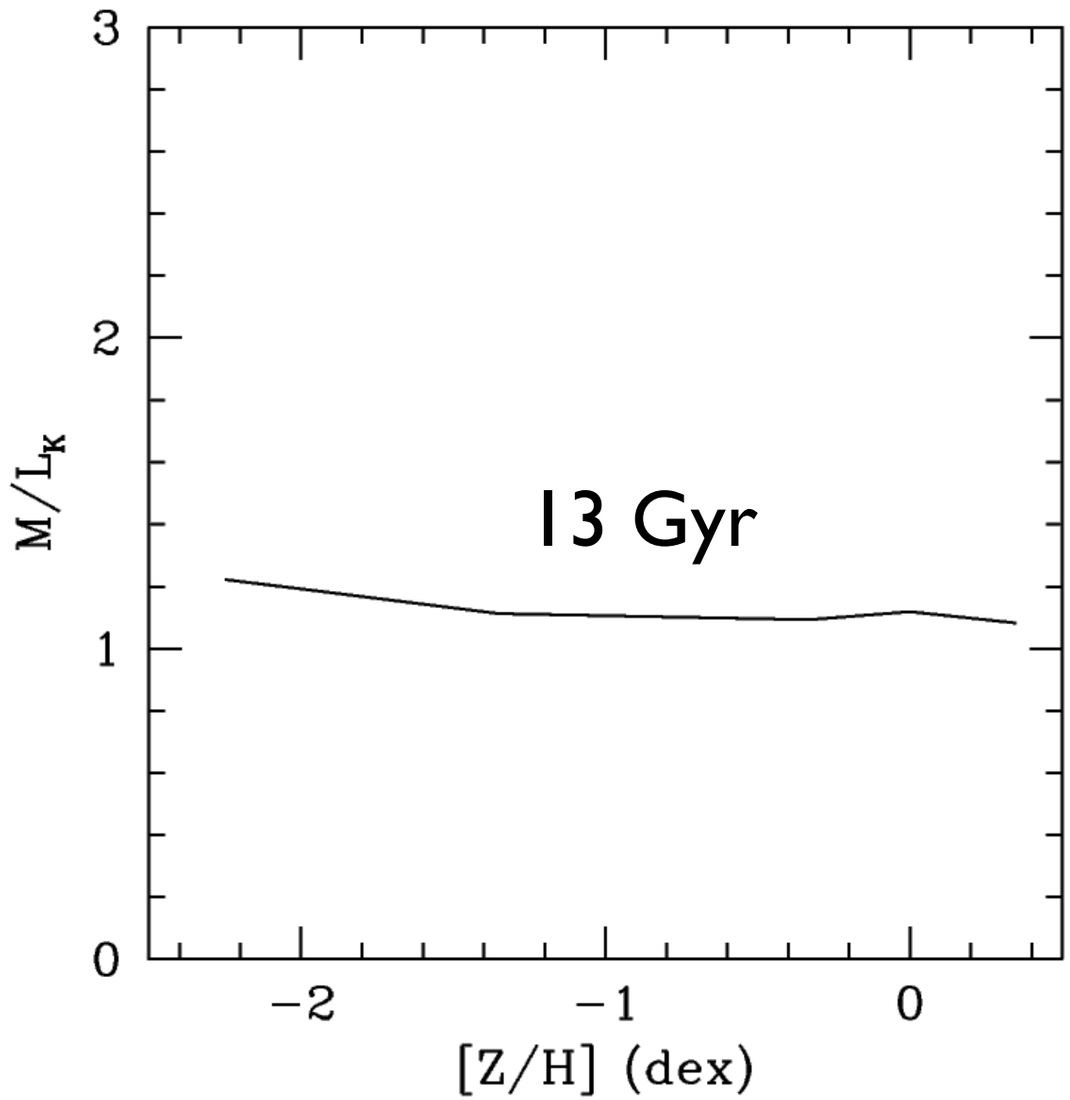
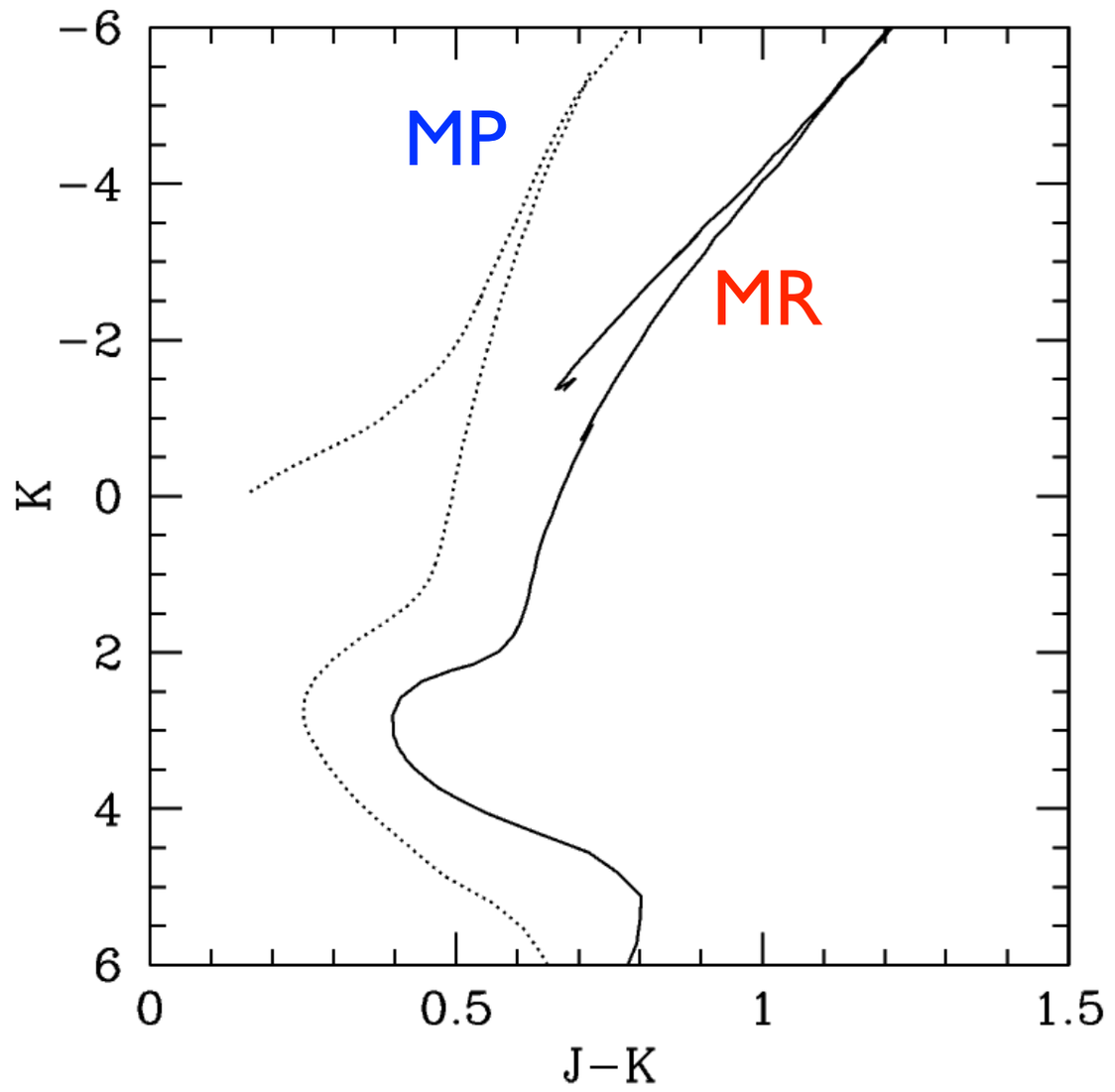




Calculating M/L

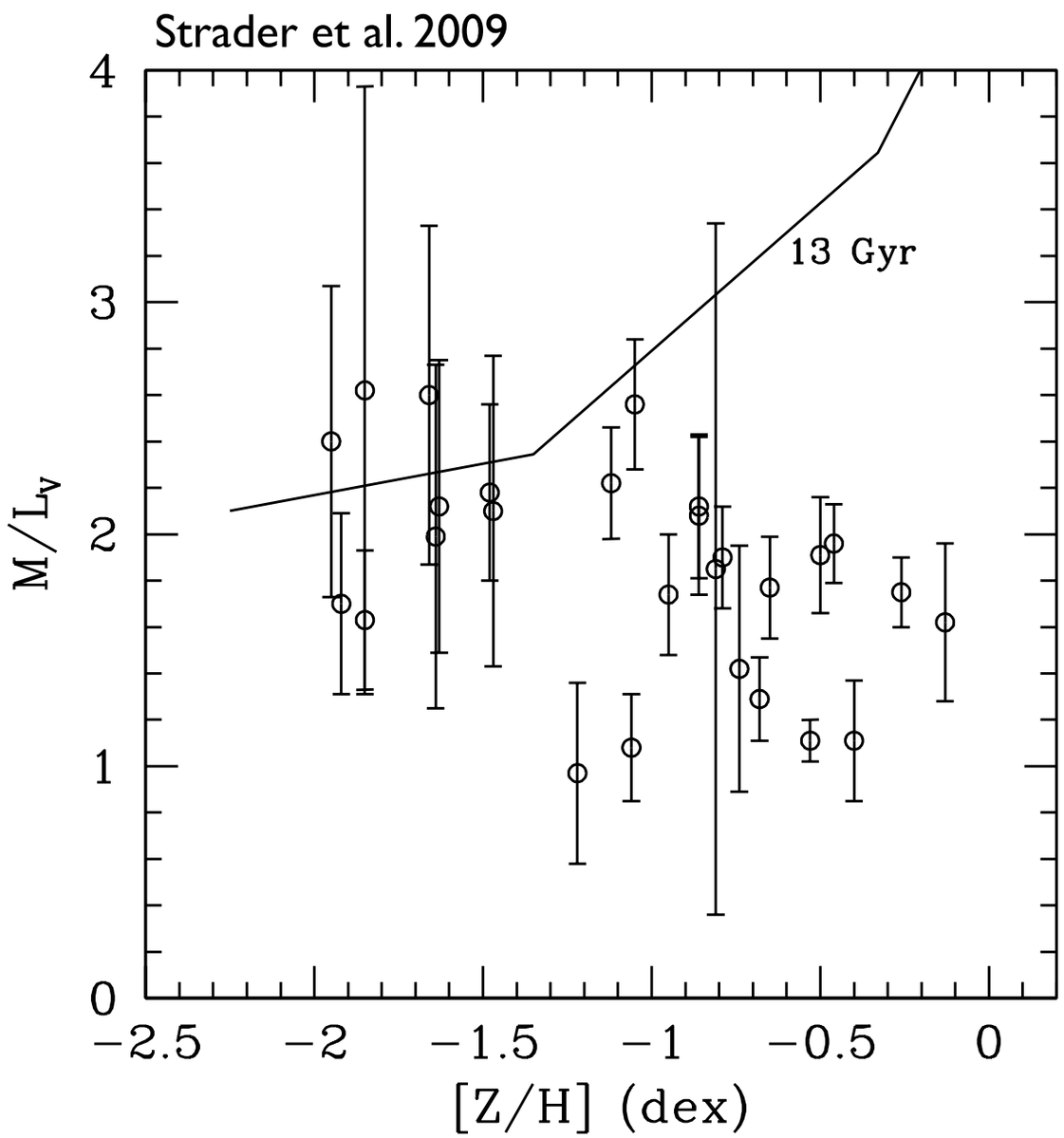
$$M_{\rm vir} = \frac{7.5\sigma_\infty^2 r_{hm}}{G}$$

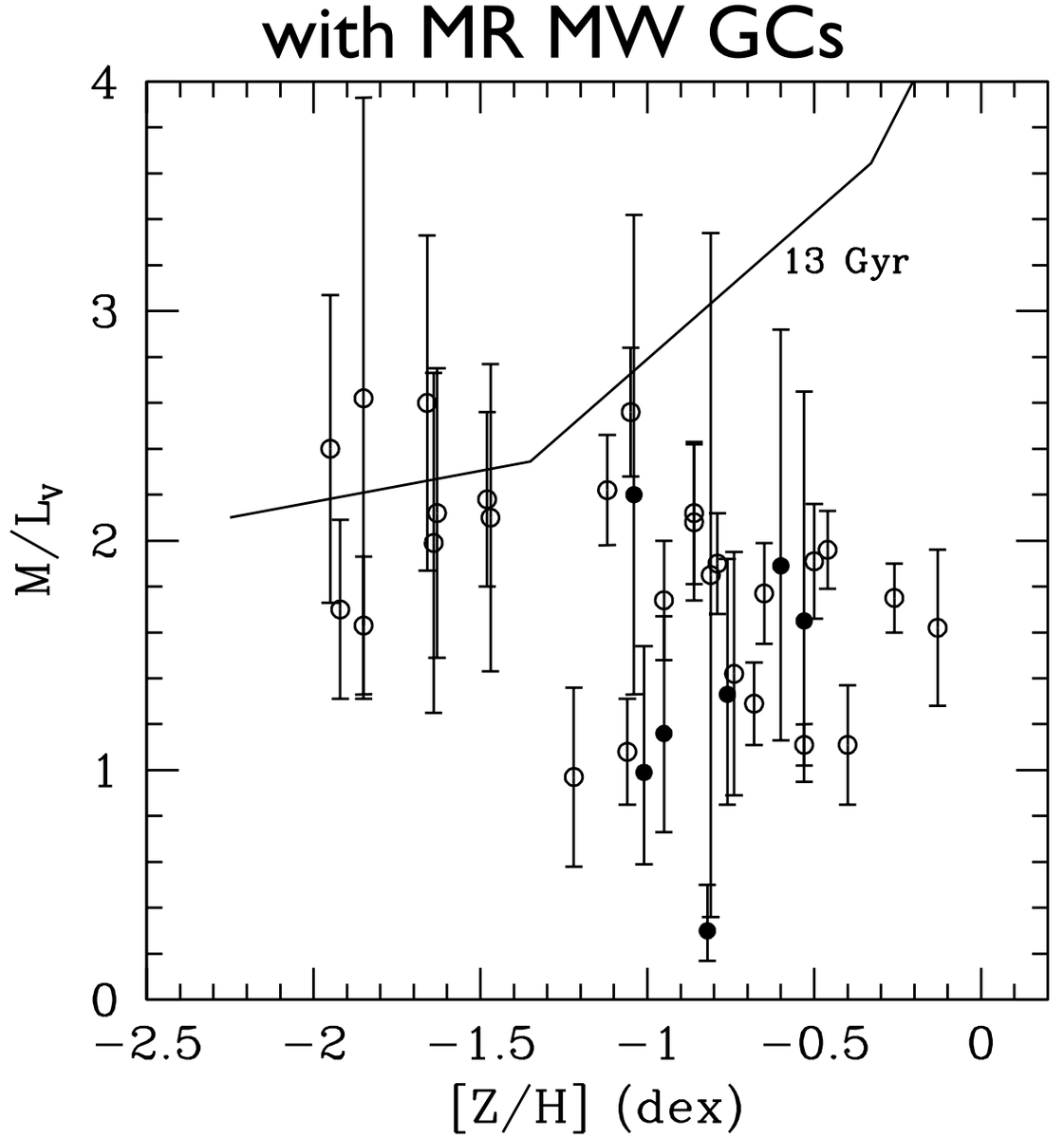
high-res spectra + cluster structure

good imaging (pref HST)

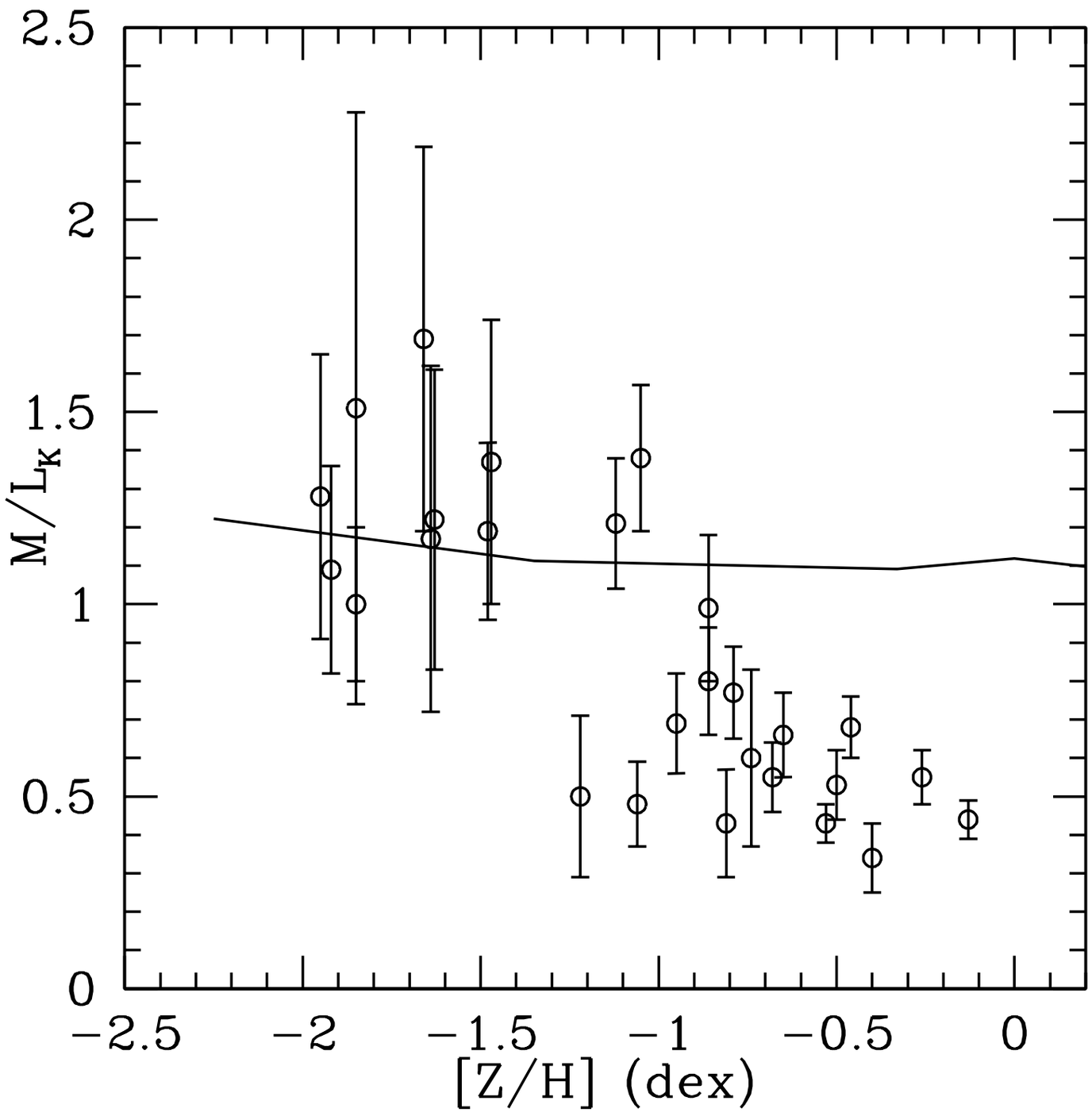
In M31, extinction is important for L!

M/L of 27 M31 GCs

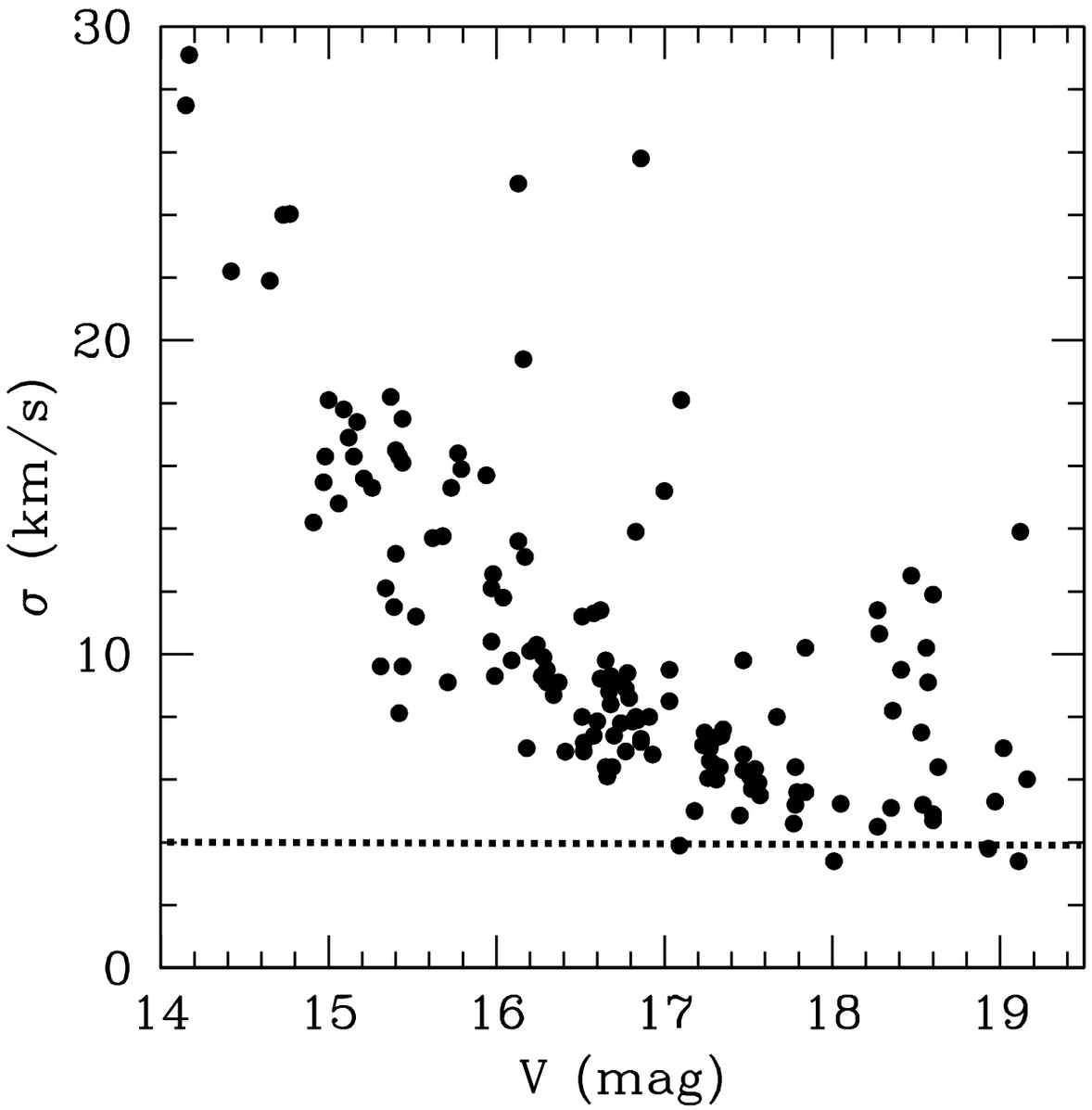




K-band M/L



Hectochelle Survey

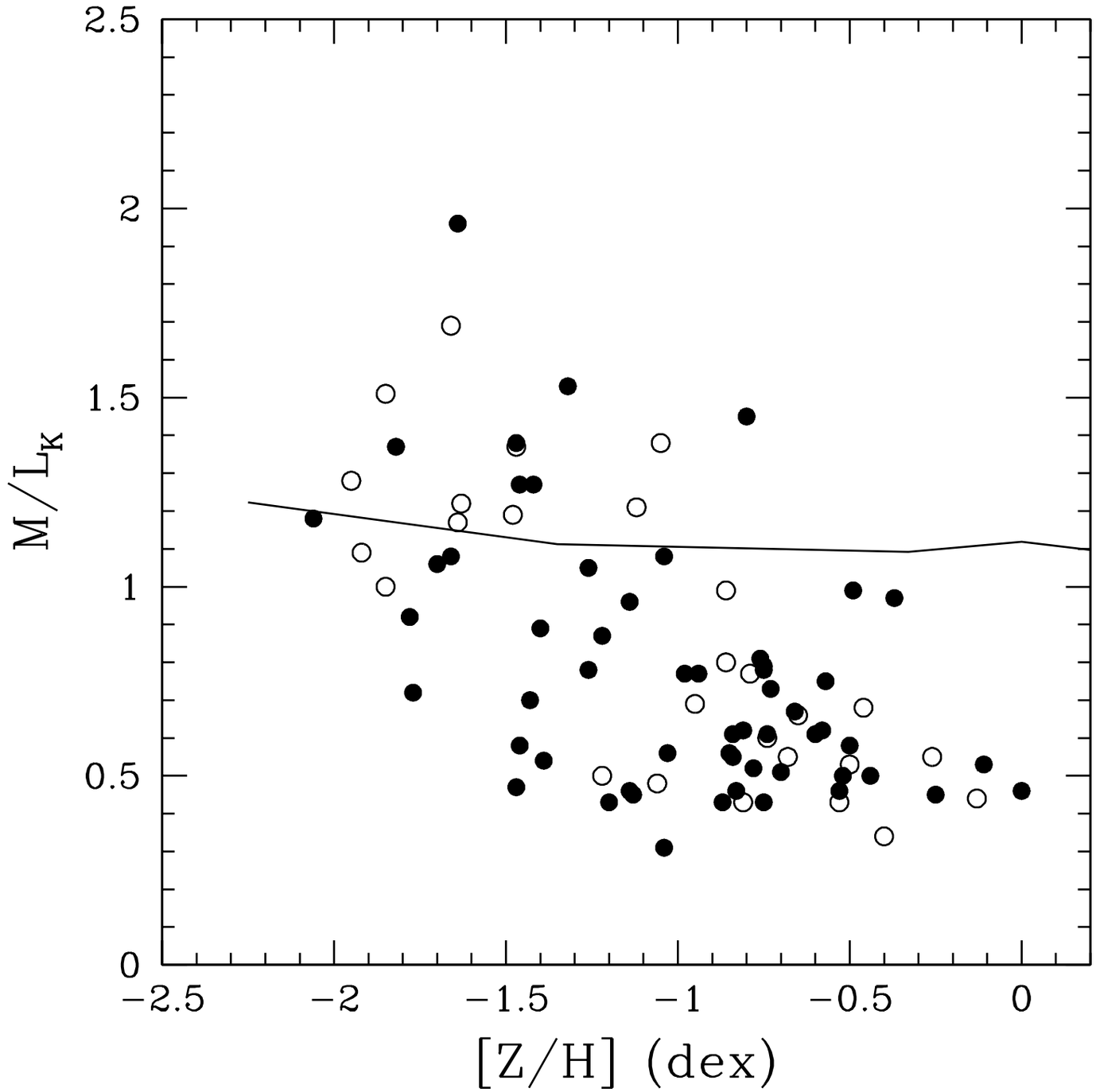


~ 1 hr exposures in several orders: Mg*b*, Ha, CaT

Good sigmas for ~ 150 GCs

Chelle resolution

Hectochelle Survey



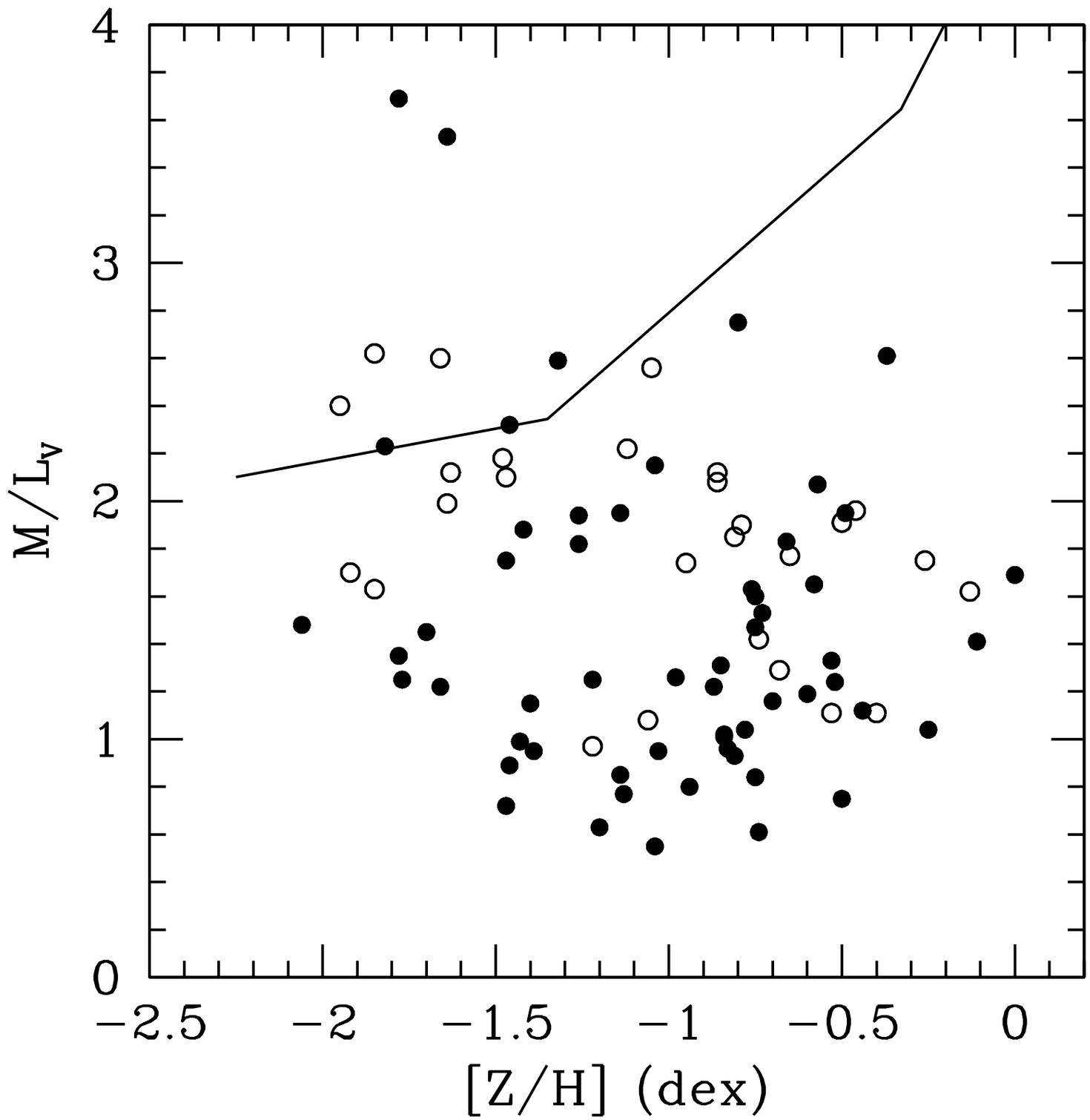
Potential Explanations

(i) Enhanced dynamical evolution of MR GCs

(ii) Issues with the LF for RGB/AGB stars

(iii) IMF variations

Using Galactic bulge and
Magellanic Cloud GCs to test.


4
3
2
1
0
M/L_V
−2.5
−2
−1.5
−1
−0.5
0
[Z/H] (dex)