The FRMS scenario implications on present day globular clusters

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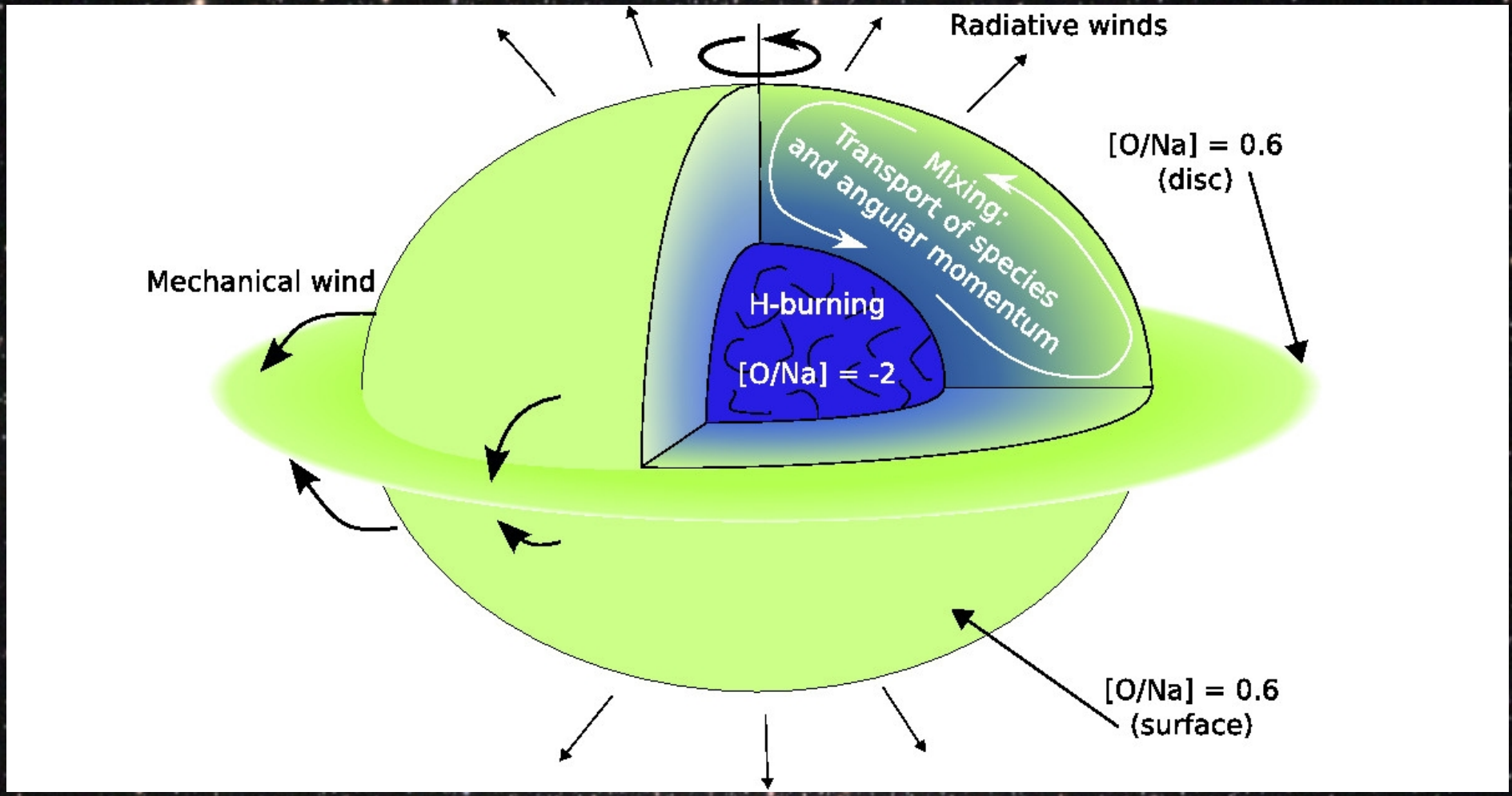
Outline

- Fast Rotating Massive Star scenario
- 2G star behaviour
- Implications on the globular clusters' star distribution

Fast Rotating Massive Stars (FRMS) scenario (Decressin et al. 2007b)

- Mass > 25 Msun
- H-burning products at very high temperature in the central parts during the main sequence
- Chemical elements transported to the surface through the rotationnal mixing
- Slow mechanical and equatorial wind
- Helium content of the ejecta from 0.248 to a value higher than 0.4

FRMS scenario (Decressin et al. 2007b)



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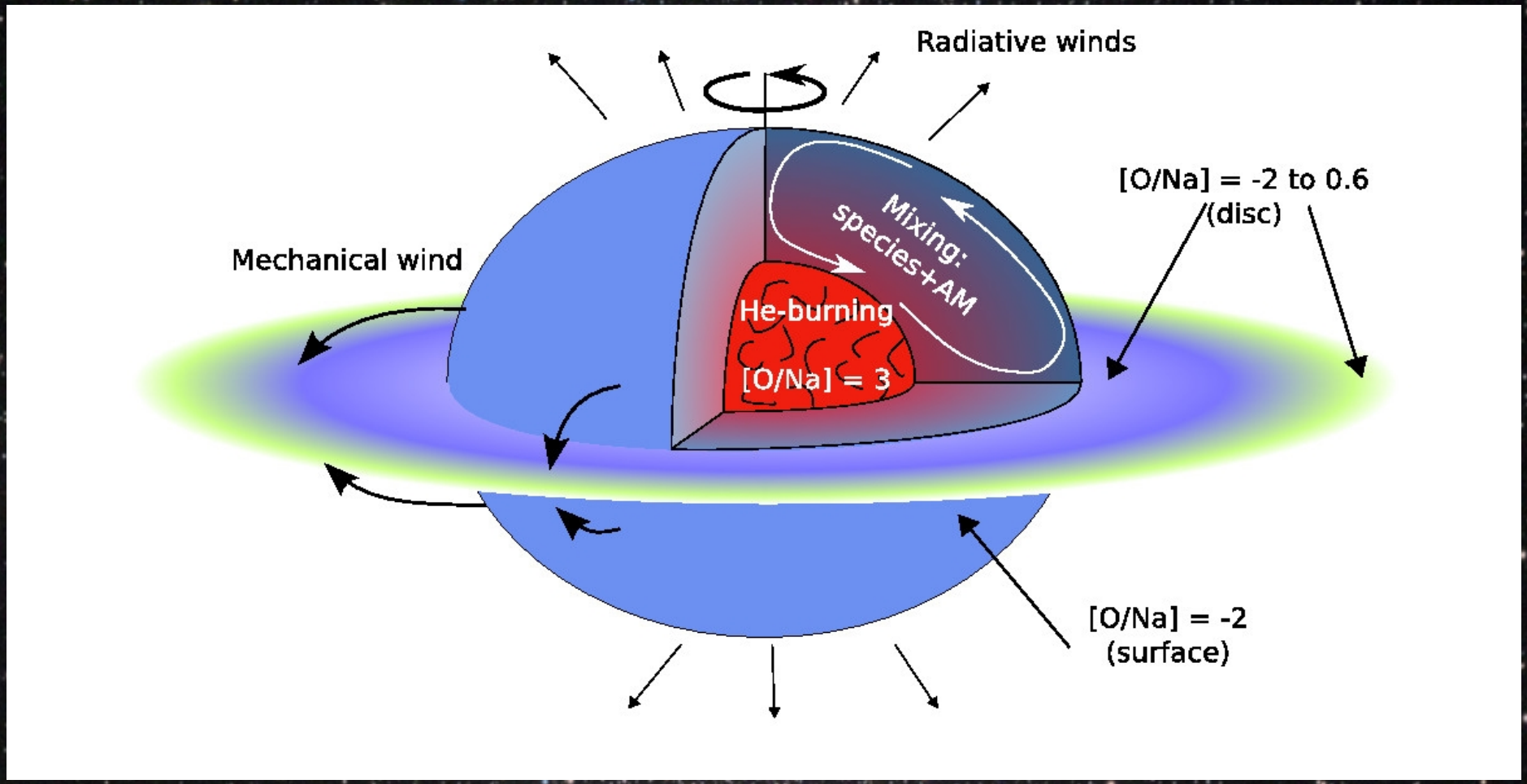

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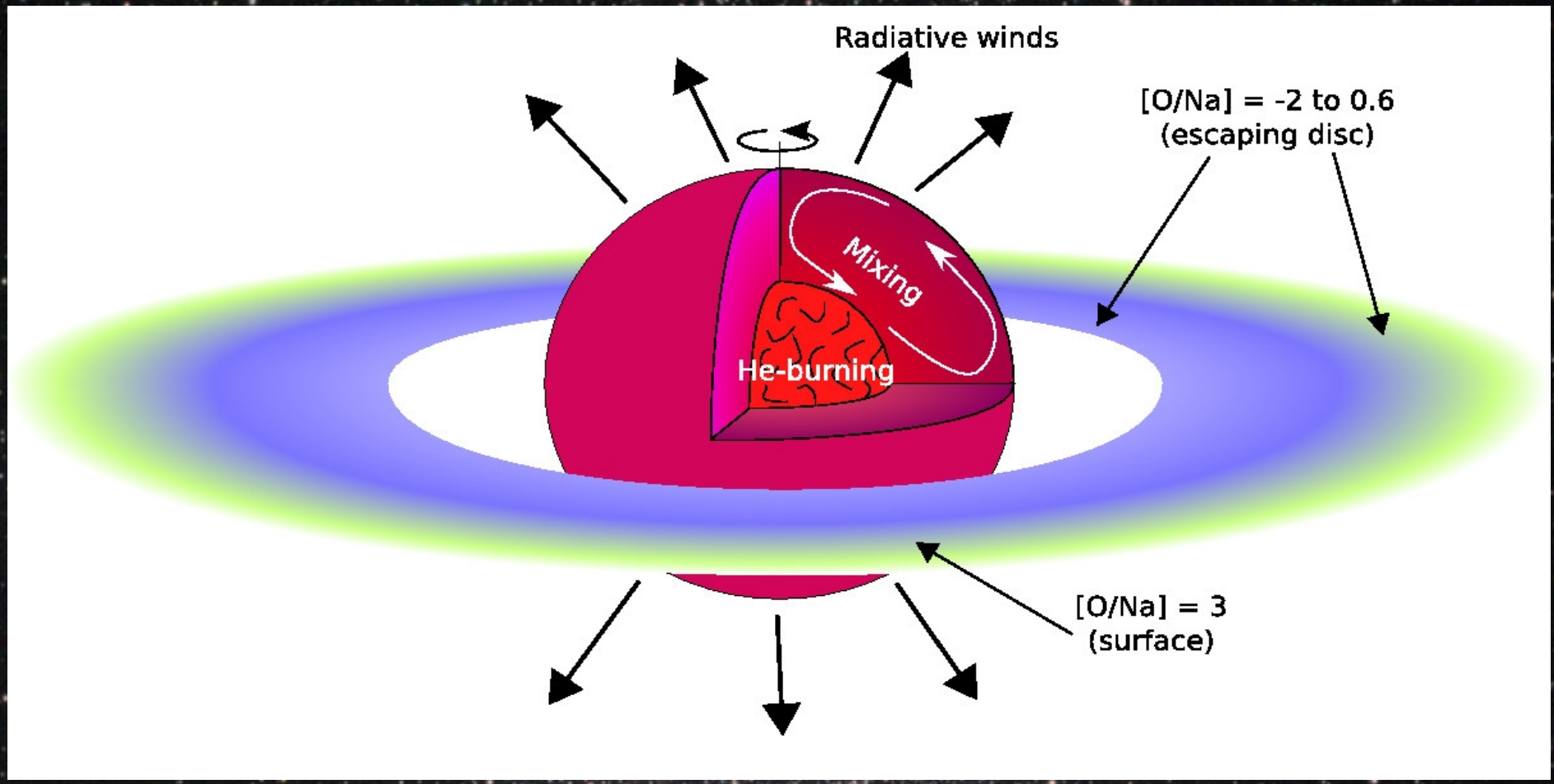
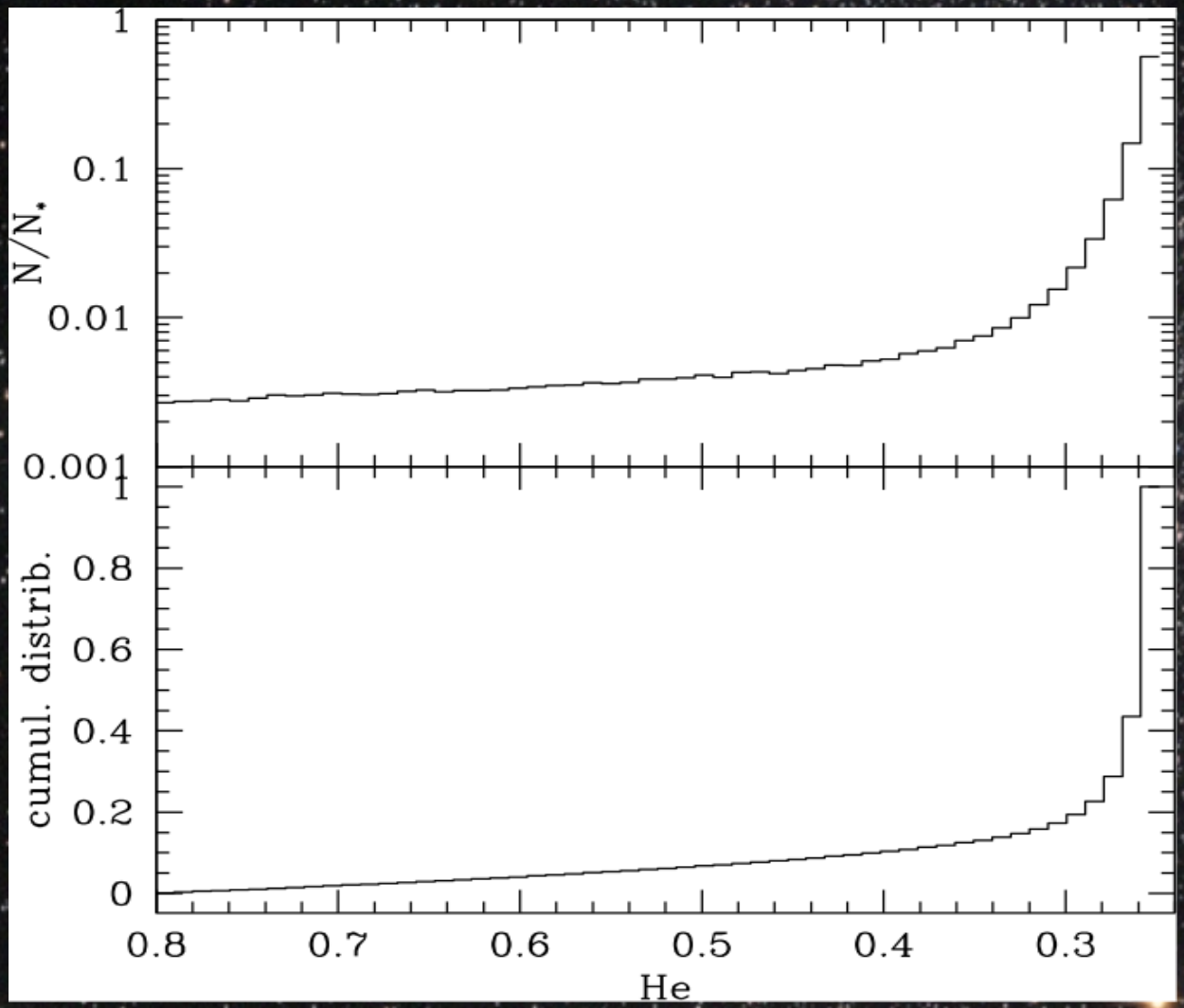


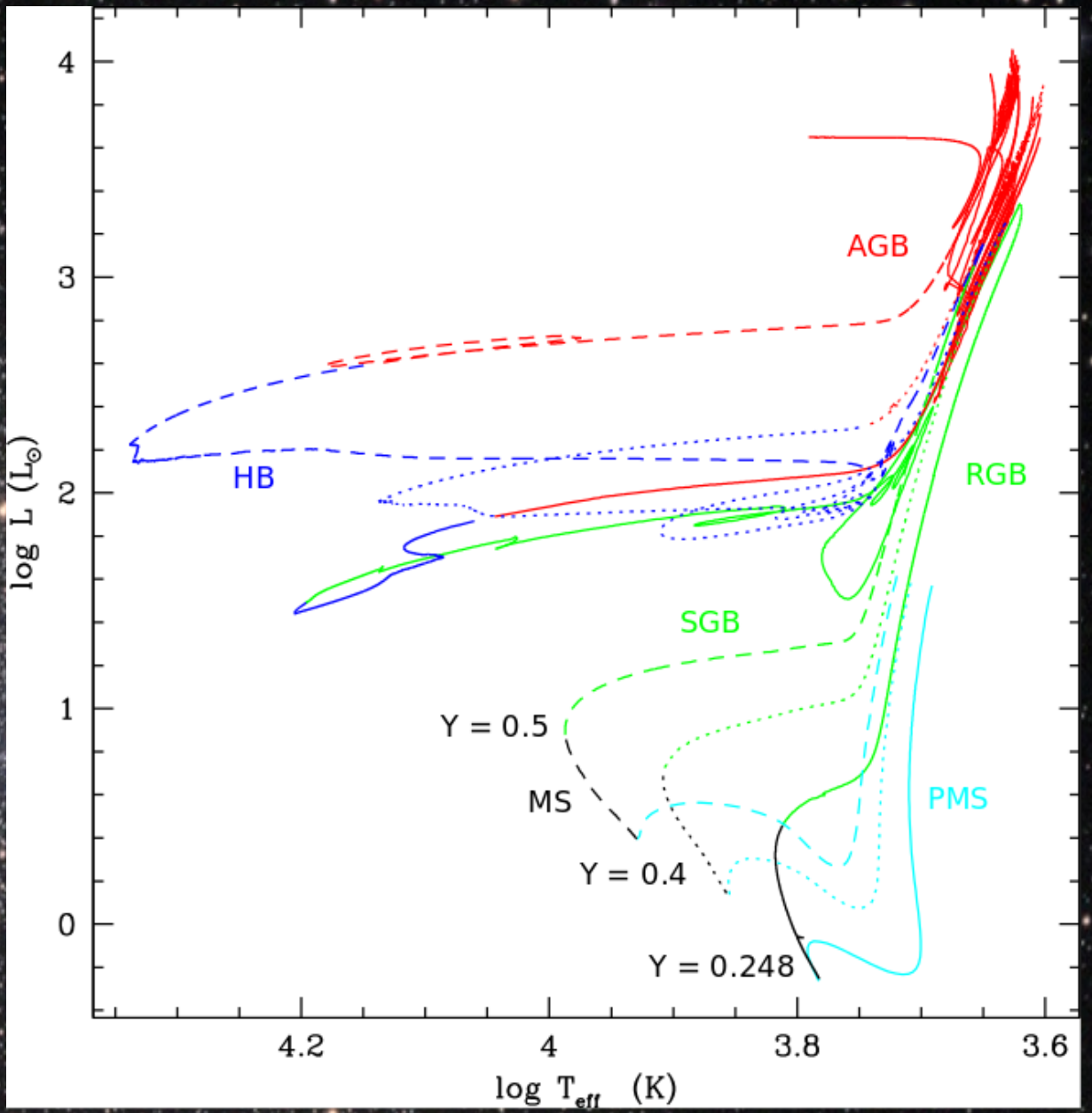
Initial He distribution for the 2G stars from the FRMS scenario

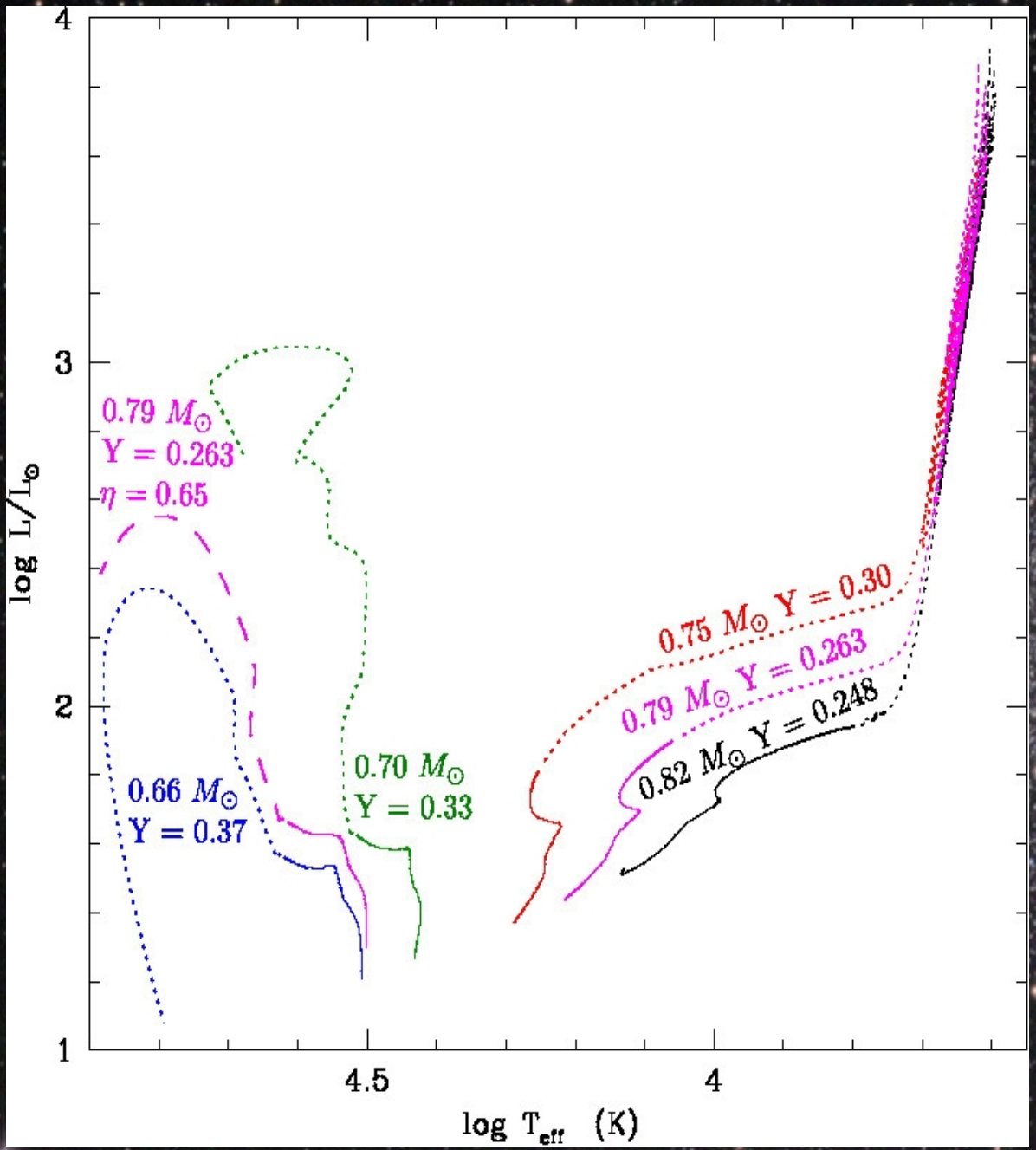


- Around 7 % of the stars with an initial He above 0.4 and up to 0.8

- Greater mean molecular weight and lower opacity because of the He content

- Shift to the bluer and higher L part of the HRD



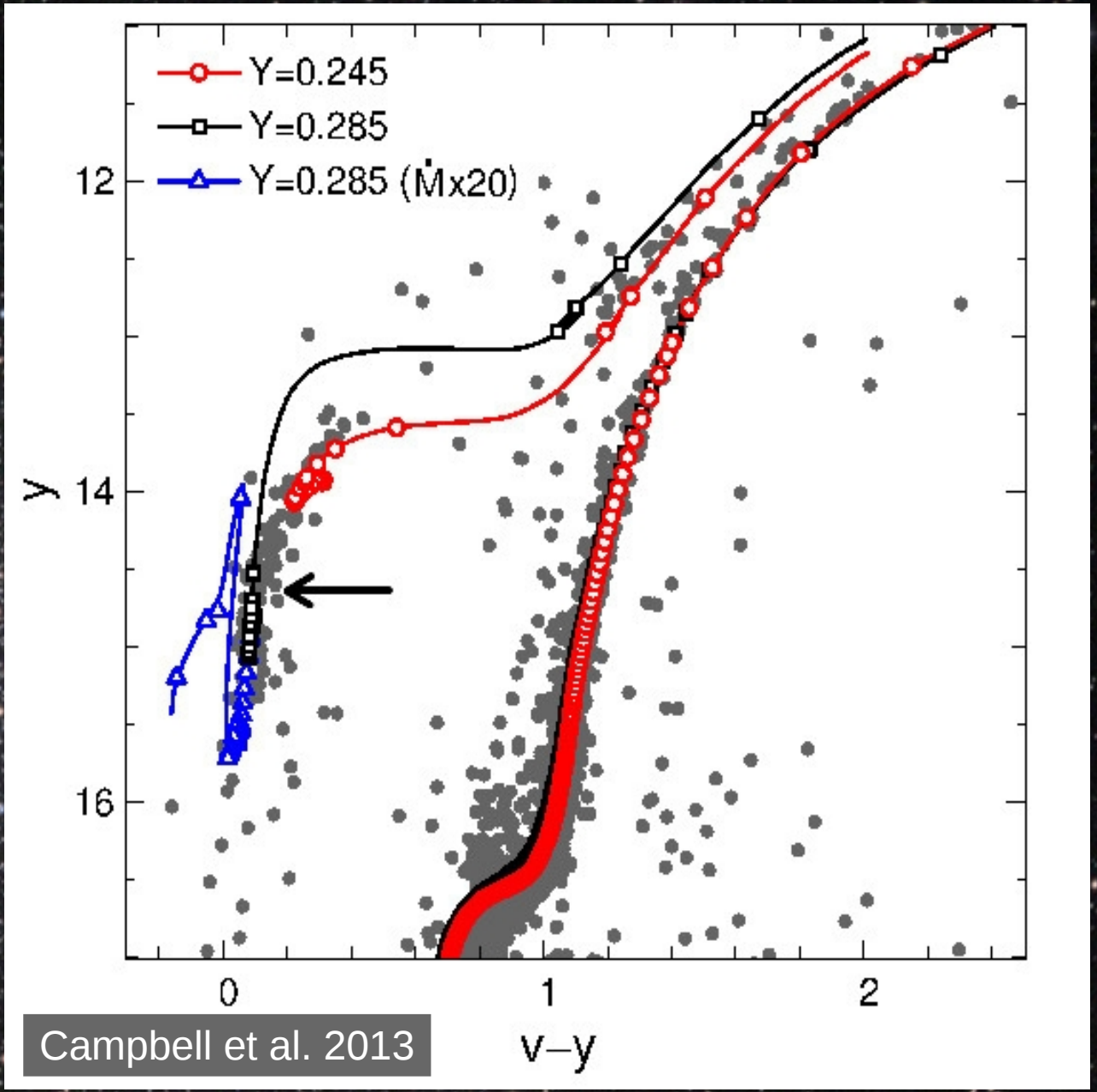


Peculiar well-known behaviour :

Late hot flasher and AGB-manqué

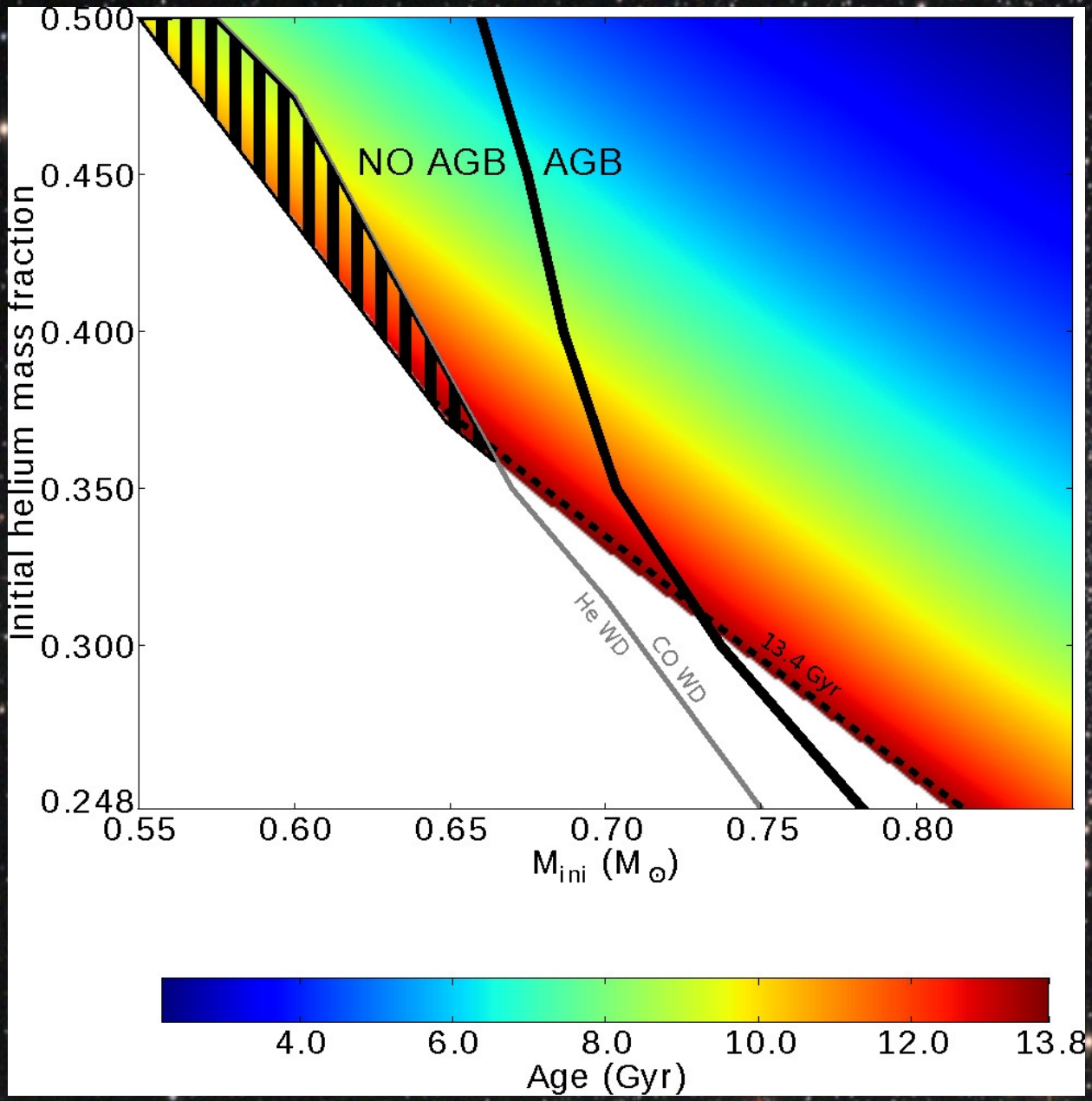
(Charbonnel et al. 2013)

Suitable explanation for the lack of sodium-rich stars on the AGB



Campbell et al. 2013

Fate and age of the 2G stars



Age at the end of the HB or at the RGB tip for stars ending as He WD.

(Charbonnel et al. 2013)

Conclusion

- Low proportion of « super He-rich stars » at he birth of the second generation
- Suitable explanation for the absence of sodium-rich stars on the AGB
- No super He-rich stars on the HB and AGB and very difficult to observe on the MS and RGB

Thank you