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Core-hydrogen-burning RSGs in the early globular clusters

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Abstract. The first stellar generation in galactic globular clusters contained massive low-metallicity stars (Charbonnel *et al.* 2014). We modelled the evolution of this massive stellar population and found that such stars with masses 100-600 $M_{\odot}$ evolve into cool RSGs (Szécsi *et al.* 2015). These RSGs spend not only the core-He-burning phase but even the last few 10^5 years of the core-H-burning phase on the SG branch. Due to the presence of hot massive stars in the cluster at the same time, we show that the RSG wind is trapped into photoionization confined shells (Mackey *et al.* 2014). We simulated the shell formation around such RSGs and find them to become gravitationally unstable (Szécsi *et al.* 2016). We propose a scenario in which these shells are responsible for the formation of the second generation low-mass stars in globular clusters with anomalous surface abundances.

Keywords. globular clusters: general, stars: abundances, stars: formation, stars: supergiants

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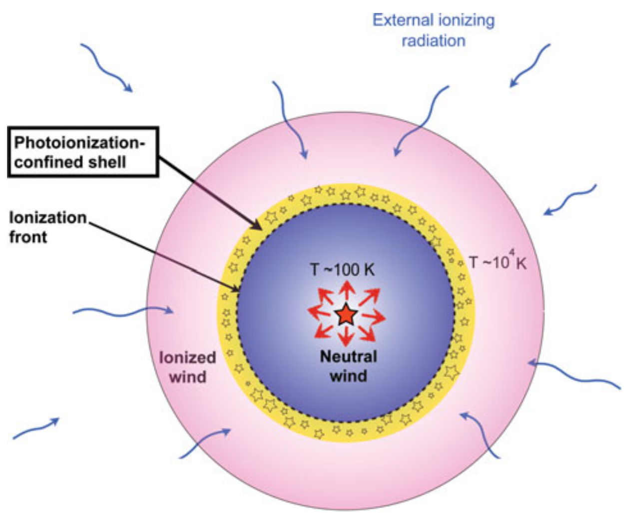

Figure 1. Photoionization-confined shell around a core-hydrogen-burning cool supergiant star (red five-point star symbol). The second generation of low mass stars (open star symbols) are formed in the shell. This scenario could be common in the first few megayears of the early globular clusters, explaining the pollution of the second generation (Szécsi *et al.* 2016).

References

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