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June 2022

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Publications

Anand, G. S. *et al.*, 2021, MNRAS, 501, 3621
Barnes, A. T. *et al.*, 2022, arXiv e-prints, arXiv:2205.05679
Emsellem, E. *et al.*, 2022, A&A, 659, A191
Kreckel, K. *et al.*, 2020, MNRAS, 499, 193
Lee, J. C. *et al.*, 2022, ApJS, 258, 10
Leroy, A. K. *et al.*, 2021a, ApJS, 255, 19
Leroy, A. K. *et al.*, 2021b, ApJS, 257, 43
Scheuermann, F. *et al.*, 2022, MNRAS, 511, 6087

1 Introduction

The exact time scale on which HII regions evolve is difficult to pin down. One approach is via the ages of underlying star clusters (e.g. Whitmore *et al.* 2011; Hannon *et al.* 2019; Hannon *et al.* 2022; Stevance *et al.* 2020) , which can be estimated by fitting the observed *spectral energy distribution* (SED) to theoretical models (Turner *et al.* 2021). Another approach is with the help of statistical models (e.g. Chevance *et al.* 2020; Kim *et al.* 2021). Direct constraints from the ionised nebula on the other hand are rather rare (Dottori 1981). One possibility is the Hα equivalent width EW(Hα) (Copetti, Pastoriza, Dottori 1986; Fernandes, Leão, Lacerda 2003; Levesque and Leitherer 2013). Another possible route is via the Hα/FUV ratio. Both fluxes are extensively used, most commonly as tracers for star formation (Hermanowicz, Kennicutt, Eldridge 2013; Meurer *et al.* 2009), but they have also been used on cloud scales as age indicators (e.g. Sánchez-Gil *et al.* 2011; Faesi *et al.* 2014). The Hα flux is dominated by the most massive stars in the cluster. The FUV and the stellar continuum on the other hand have a significant contribution from lower mass stars. Hence once the most massive stars start to die, both ratios start to decline. This can also be seen in models like STARBURST99 (Leitherer *et al.* 2014), BPASS (Eldridge and Stanway 2009) or CLOUDY (Ferland *et al.* 2017), which predict that the ratio decreases monotonically with the age of the cluster.

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