

## AGE DETERMINATION OF GALACTIC HII REGIONS

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ABSTRACT.  $[OIII]/H_{\beta}$  and  $WH_{\beta}$  were measured photoelectrically in 29 galactic HII regions with  $7^h:30^m < \alpha < 13^h$ . The ages of these nebulae were estimated from the HII region evolutive models of Copetti et al. (1984).

## I. INTRODUCTION

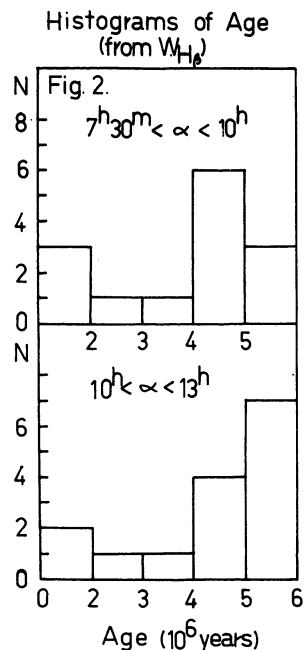
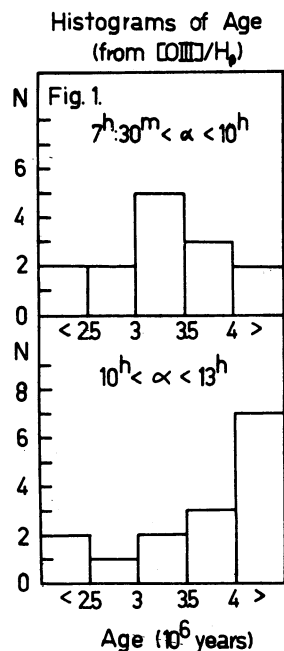
In a previous paper (Copetti et al., 1984) the behavior of the properties  $WH_{\beta}$  (the equivalent width of the  $H_{\beta}$  emission line) and  $[OIII]/H_{\beta}$  (the ratio of the intensity of the  $[OIII] \lambda\lambda 4959, 5007$  lines to  $H_{\beta}$ ) were studied as a function of the evolution of an HII region through models which took into account: a burst for the formation of the ionizing association; different initial mass function IMF; upper stellar mass limit  $M_u$  between 30 and 120  $M_{\odot}$ ; models of stellar evolution with and without mass loss. It was found that  $WH_{\beta}$  and  $[OIII]/H_{\beta}$  decrease monotonically as a function of the time and were consequently good HII region age indicators.

Here, these models are compared with measurements of  $WH_{\beta}$  and  $[OIII]/H_{\beta}$  for galactic HII regions in order to estimate their ages.

## II. THE OBSERVATIONS

$[OIII]/H_{\beta}$  and  $WH_{\beta}$  were measured photoelectrically in 29 galactic HII regions with right ascension between  $7^h:30^m$  and  $13^h$ . The observations were obtained in 1984 february at Cerro Tololo Inter-American Observatory with the 60 cm telescope. The interference filters used were: the  $H_{\beta}$  narrow, with passband  $\Delta\lambda = 30 \text{ \AA}$ ; the  $H_{\beta}$  wide, with  $\Delta\lambda = 150 \text{ \AA}$ ; the  $[OIII]$  centered at  $5000 \text{ \AA}$  and with  $\Delta\lambda = 70 \text{ \AA}$ . The measurements were calibrated through spectrophotometric standard stars (Oke, 1974). From the RCW catalogue of galactic emission nebulae (Rodgers et al., 1960) those HII regions with diameter  $\varnothing < 4'$  were selected,

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which allowed the global observation of the objects.

### III. CONCLUSIONS

The measurements of  $WH_{\beta}$  and  $[OIII]/H_{\beta}$  of the 29 galactic HII regions were analysed using the models of Copetti *et al.*, (1984). The observed HII regions were divided into two groups:  $7^h:30^m < \alpha < 10^h$  and  $10^h < \alpha < 13^h$ . The figures 1 and 2 show the histograms of ages obtained from the  $[OIII]/H_{\beta}$  and  $WH_{\beta}$  values, respectively. The HII regions within the interval  $7^h:30^m < \alpha < 10^h$  seem to be generally younger than those within  $10^h < \alpha < 13^h$ .

### REFERENCES

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