

STAR FORMATION RATE IN HOLMBERG IX DWARF GALAXY

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Abstract. In this paper we derive star formation rate (SFR) for irregular dwarf galaxy Holmberg IX, member of M81 galaxy group. Star formation rate is calculated using H α fluxes of HII regions in this galaxy, observed in March 2008 from National astronomical observatory Rozhen, Bulgaria (Arbutina et al. 2009). We discuss possible sources of contamination of H α flux, such as contamination with close [NII] lines, host galaxy extinction, and supernova remnants (SNR) contamination, which is here discussed for the first time in literature.

H α luminosity of HII regions around stars is direct measure of the global photoionization rate, which can be used to estimate SFR (Kennicutt et al. 1994). When the total H α flux of a galaxy is calculated, there are other H α emitters, such as other emission nebulae and active galactic nuclei (AGN), which can be confused with radiation from HII regions. In this paper, our observations enabled us to remove radiation from one ultra luminous, shock-heated nebula (Miller 1995), known as M&H 9-10 (Miller and Hodge 1994), that could be a super-shell, or a possible hypernova remnant.

After removal of possible SNR contamination, our calculated SFR for Holmberg IX galaxy is $3.4 \times 10^{-4} M_{\odot} \text{yr}^{-1}$, which is up to ten times lower than in previous studies (Karachentsev and Kaisin 2007, James et al. 2004).

References

- Arbutina, B., Ilić, D., Stavrev, K. et al.: 2009, *Serb. Astron. J.*, **179**, 87.
 James, P. A., Shane, N. S., Beckman, J. E. et al.: 2004, *Astron. Astrophys.*, **414**, 23.
 Karachentsev, I. D. and Kaisin, S. S.: 2007, *Astron. J.*, **133**, 1883.
 Kennicutt, R. C., Tamblyn, P. and Congdon, C. E.: 1994, *Astrophys. J.*, **435**, 22.
 Miller, B.W.: 1995, *Astrophys. J.*, **446**, L75.
 Miller, B.W. and Hodge, P.: 1994, *Astrophys. J.*, **427**, 656.