OBSERVATIONAL EVIDENCE OF STAR FORMATION STPCHASTICITY IN THE CALIFA DATASET

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En este trabajo estudiamos datos espectrales publicados por el grupo del sondeo CALIFA. Encontramos que al analizar regiones de baja formación estelar (SFR) se observan fluctuaciones de la razón H_α/H_β que no son completamente explicadas por efectos de polvo interestelar. Proponemos que esta fluctuación detectada es debida a la influencia de procesos estocásticos, los cuales han sido cuantificados en simulaciones anteriores.

In this work, we study spectral data published by the CALIFA survey. When analyzing regions of low star formation rate (SFR) we find fluctuations of the H_α/H_β which are not fully explained by interstellar dust effects. We propose that the detected fluctuation is due to the influence of stochastic effects, which have been quantified in previous simulations.

Using the CALIFA data published by PIPE3D**?**, we study the ratio between the H_α and H_β emission line intensities. According to simulations, regions of low SFR are susceptible to stochastic effects due to irregular bursts of star formation as well as finite sampling in mass and time. The combination of these factors is believed to cause fluctuation of emission line intensities**?**. With the CALIFA data, we make a histogram of the H_α/H_β value distribution, discriminating data according to high SFR $\left(> 1.89 \times 10^{-1}\,M_\odot yr^{-1}\right)$, low SFR $\left(< 2.99 \times 10^{-2}\,M_\odot yr^{-1}\right)$ and a region in between. This provides a visualization of emission line fluctuations according to different SFR.

In**?**, fluctuations of the Ly_α EW where also detected, in order to study effects on EW, we analyse the OII EW. Once again, we discriminate data according to the previous high, mid and low SFR and check if the distribution of the EW varies according to SFR.

Despite lacking dust effect corrections, we can put forth stochasticity as a significant influence in low SFR regions. This is because dust is not as abundant in low SFR regions as it is in high SFR regions. Furthermore, interstellar reddening causes fluctuation in only one direction, which is not the case for the data. In our results, data associated with low SFR values is clearly more broadly distributed than at higher SFR. A fitting procedure was performed on the observed distributions and

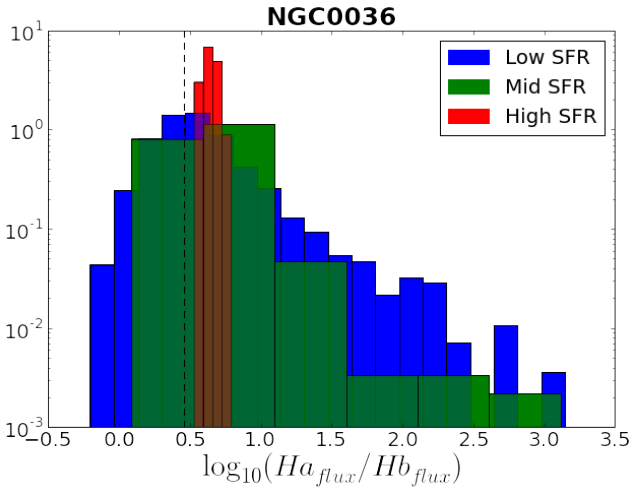

Fig. 1. Distribution of H_α/H_β values according to high, mid or low SFR.

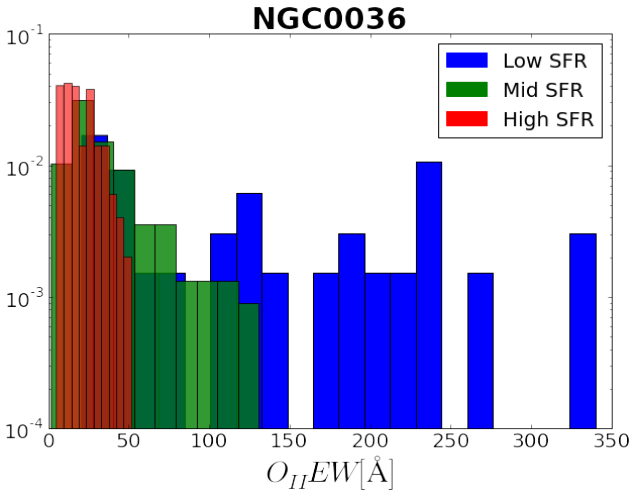

Fig. 2. Distribution of OII EW values according to high, mid or low SFR.

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was found to follow the behaviour described in simulations**?**.

REFERENCES

J. E. Forero-Romero and M. Dijkstra. Effects of star-formation stochas-ticity on the Ly and Ly-man continuum emission from dwarf galaxies-during reionization. In: 428 (Jan. 2013), pp. 21632170.doi:10.1093/mnras/sts177. arXiv:1206.0726

S. F. Sánchez et al. Pipe3D, a pipeline to analyze Integral Field Spec-troscopy Data: II. Analysis sequence and CALIFA dataproducts. In:52 (Apr. 2016), pp. 171220. arXiv:1602.01830 [astro-ph.IM].