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The stellar populations of the AGN/Starburst galaxy NGC7582

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Abstract. NGC 7582 is defined as a Starburst/AGN galaxy, since its optical and X-Ray spectra reveal both characteristics. In this work, we show the results of a stellar population modeling in a datacube taken with the Gemini South telescope. We found that $\sim 90\%$ of the light in the field of view is emitted by stars that are less than 1 billion years old. A strong burst occurred about ~ 6 million years ago and has nearly solar metallicity. We also found a Wolf-Rayet cluster.

Keywords. Active galactic nuclei; Starburst galaxies; population synthesis; spectroscopy.

1. Introduction

Starburst galaxies are characterized by their strong and narrow emission lines in the optical spectra, due to a strong star formation in the galaxy center. Seyfert galaxies have broader emission lines and are interpreted as being produced by photoionization by a power-law continuum associated to a supermassive black hole. NGC 7582 has a typical H II region spectrum in the optical (Veron *et al.* 1981) but its X-Ray emission is typical of a Seyfert 1 galaxy (Ward *et al.* 1978). In this work our goal is to analyze the stellar population located in the 3.5" x 5" central region of NGC 7582.

2. Observations and Methodology

Our observations were taken with the GMOS-IFU (Allington-Smith *et al.* 2002) on the Gemini South telescope. We used the B600-G5323 grating, producing a spectral range of 4230-7070 $\dot{A}$ with R = 2400 (as measured from the 5577 $\dot{A}$ sky line). The final datacubes are corrected from the atmospheric differential refraction; we also performed a Richardson-Lucy deconvolution with 6 iterations on the image in each spectral pixel. The stellar population synthesis was made using the *Starlight* code (Cid Fernandes *et al.* 2005) on the spectrum of each spatial pixel, with a sampling of 0.05" x 0.05". Maps of different population were constructed, revealing age and metallicity structures. These results will be published elsewhere.

3. Results and conclusions

Figure 1 shows the cumulative flux fraction as a function of stellar age. It is clear that about 90% of the light in the field of view is emitted by stars that are less than 1 billion

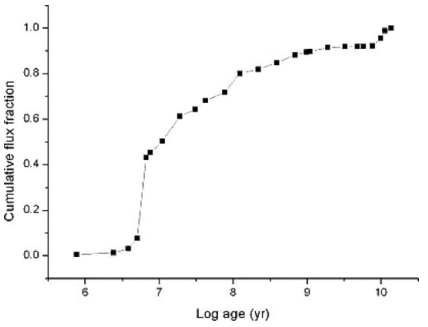

Figure 1. Cumulative flux fraction as a function of the stellar age of the entire field of view.

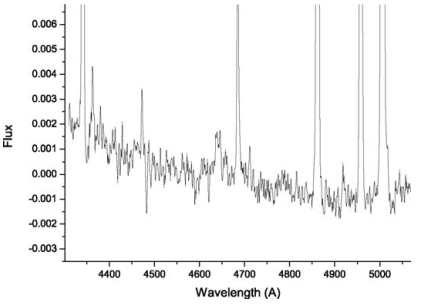

Figure 2. The spectrum showing the WR feature at 4600 to 4700 $\dot{A}$. This spectrum was extracted at a position 1.4" west and 1.0" north of the AGN.

years old. There seems that a more or less continuum star formation episodes have occurred in this period. Nearly half of the light is emitted by stars less than 10 million years old. A strong event occurred $\sim$ 6 million years ago. This young stellar population shows nearly solar metallicity and is concentrated in three clumps that might be associated with the ionizing sources of the three observed H II regions. One of the clumps, located nearly 1.4" West and 1.0" North of the AGN presents a Wolf-Rayet feature, shown in Figure 2. This feature has broad C III/N III + He II emission between 4600 $\dot{A}$ and 4700 $\dot{A}$.

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