

## The identification of the star SPH 2 as a new WN4 star with strong C IV

Claudio Bastos Pereira

*Departamento de Astronomia Galáctica, Observatório Nacional,  
Rio de Janeiro, Brazil*

Maria Auxiliadora Delgado Machado

*Departamento de Astrofísica, Observatório Nacional,  
Rio de Janeiro, Brazil*

**Abstract.** We report on the spectroscopic observation of a new Wolf-Rayet star not already identified. This star is located in our Galaxy, in the Canis Majoris region and was found during a southern spectroscopic survey of stars previously identified as H $\alpha$  emission objects. The star, SPH 2, after Schwartz, Persson & Hamann (1990), shows the main characteristics of a WN star and a strong C IV 5808 Å emission line typical of a WC star.

### 1. Introduction

In this work we present spectroscopic observations of the emission line star SPH 2, first recognized as H $\alpha$  emission object after a prism-objective survey by Schwartz *et al.* 1990. This star was discovered as a new nitrogen Wolf-Rayet (WN) star in the framework of the spectroscopy survey of some H $\alpha$  emission line objects in the southern hemisphere. Spectroscopic observations were performed using a Boller & Chivens cassegrain spectrograph at 1.52m ESO telescope at La Silla (Chile).

### 2. Description of the spectrum

The spectrum of SPH 2 shows the main nitrogen lines that characterizes a WN star. We can observe the presence of N IV  $\lambda$ 4057 Å and N V  $\lambda$ 4603,4610 Å used for WN classification, as well as the strong C IV at 5808 Å characteristic of a WC spectrum. On the other hand, N III at 4640 Å is absent. Smith *et al.* (1996), in their classification scheme for WN stars, use the He II 5411/He I 5875 ratio as the primary indicator of ionization. The presence of hydrogen is indicated by an oscillating Pickering decrement. Using these criteria, SPH 2, is classified as a WN4 without hydrogen. SPH 2 is listed as WR 7a in the VIIth Catalogue of Galactic Wolf-Rayet Stars (van der Hucht 1999 and in these Proceedings).

### 3. Discussion and conclusions

Conti & Massey (1989) observed spectrophotometrically nearly all galactic Wolf-Rayet stars and in the Large Magellanic Cloud. They present a list of some WN

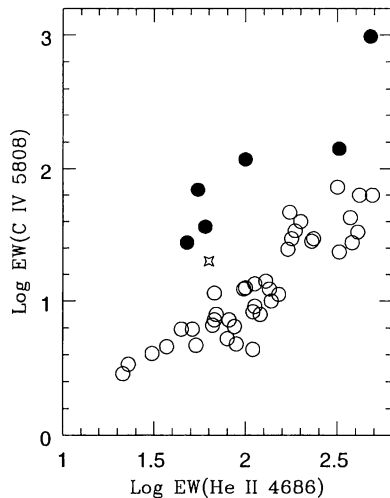


Figure 1.  $\log EW$  He II  $4686\text{\AA}$  versus  $\log EW$  C IV  $5808\text{\AA}$  as given by Conti & Massey (1989). Empty circles represent galactic WN stars and full circles WN/WC stars. SPH 2 is the star in the middle of the diagram.

stars that shows C IV  $5808\text{\AA}$  stronger than for a normal WN star. In their plot, the logarithm of the equivalent width of C IV  $5808\text{\AA}$  versus the logarithm of the equivalent width of He II  $4686\text{\AA}$  shows that there is clear difference between normal WN stars and WN/WC stars. Here, we reproduce their plot (Figure 1) where we include SPH 2. We can see that SPH 2 occupies the locus halfway of the two groups. This would be an indication that SPH 2 lies in a transition stage between WN and WN/WC. This scenario will be further investigated in a subsequent paper, using an atmospheric model that includes nitrogen and carbon lines.

## References

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