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Wavelenght calibration with WR lines

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Abstract

Key words: stars: evolution — stars: supergiants — stars: massive

Table 1. Prominent lines in WC stars (red lines)

Line Å	Element	
4650	CIII	
5696	CIII	WC8/WC9
5800	CIV	WC6
6580	CII	
7231.36	CII	
8772-8780	CIII	
9238-9267	CII	
9733-9747	CII/III blend	

- Lines are taken from Marin et al. (2024) and Crowther (2007).

Table 2. Prominent lines in WR stars (green lines)

Line Å	Element
4686	HeII
6560	HeII
7115	NIV
10124	He II (5-4)
10830	He I

- Lines are taken from Marin et al. (2024), Hamann et al. (1995), and **?**.

1 Introduction

Wolf Rayet stars have strong emission lines in their spectra. They can be identified even at the low resolution of the Gaia BPRP spectra. An example of line identification is given in Marin et al. (2024).

A catalog of Wolf Rayet stars in the Milky Way is mantained by Prof. Crowther and is available at Crowther's webpage.

2 A set of reference spectra

The database of Crowther comprises about 700 WR stars, they are already identified with Gaia DR3 sources. For the time being, I have only used a compilation of 397 stars, which I had assembled from the lists of van der Hucht (2001), Mauerhan et al. (2011), Shara et al. (2012), and Kanarek et al. (2015).

The 397 were cross-correlated with the 2MASS database, and the with the Gaia Dr3 catalog using the 2MASS name, yielding 204 secure sources and with available BPRP spectra. The Gaia source were verified on the SIMBAD database.

Known binary stars were removed, as well as stars with poor BPRP spectra or spectra with unclear classification (reported as WN or WC and showing a mix of lines, indicative of binariety); only Gaia point sources with RUWE smaller than 1.4 were retained.

In the end, a WN list of 82 stars was obtained and a WC list of 31 stars.

As said above, more stars can be added from the comprehensive compilation of Crowther, but that requires a new visual inspection.

3 News of PNs

In view of preparing for the calibration of Euclide data, some PNs were observed with VLT/X-shooter (**?**). Fits at VIZIER..

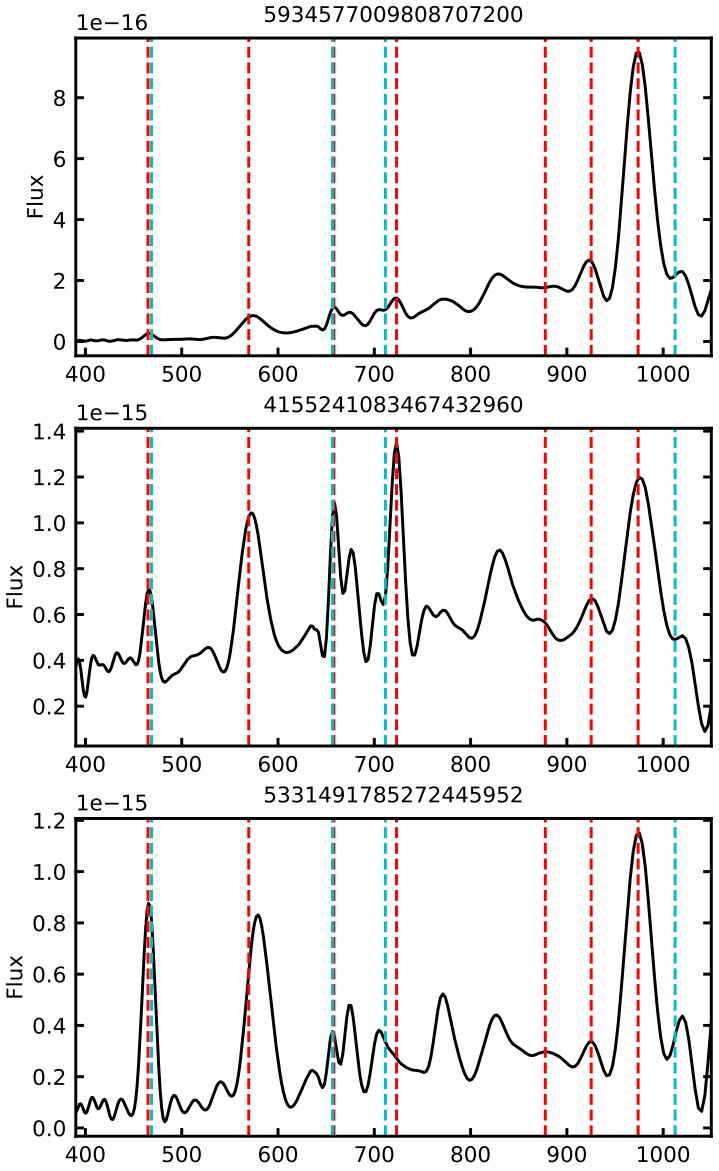

Fig. 1. Example of a WC spectrum, a WC9 at the top, a WC9d in the middle, and WC6 in the lower panel. Lines prominent in WC spectra are plotted in red, while lines prominent in WN stars in green. **Note that the lines around 550 nm change with spectral type, therefore a precise knowledge of spectral type is necessary, as shown in the table.**

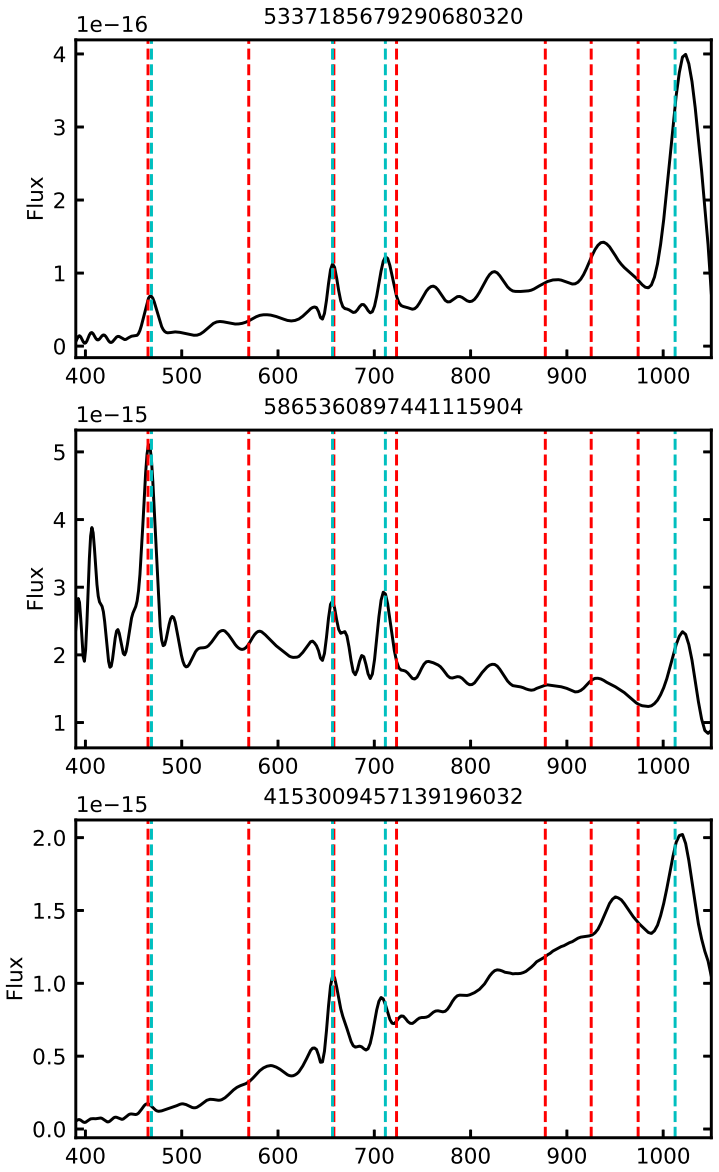

Fig. 2. Example of WN spectra, a WN4-s at the top, a WN7 in the middle, and a WN8h in the bottom panel. Lines prominent in WC spectra are plotted in red, while lines prominent in WN stars in green.

section**References**

Crowther, P. A. 2007, ARA&A, 45, 177

Euclid Collaboration, Paterson, K., Schirmer, M., et al. 2023, A&A, 674, A172

Groh, J. H., Damineli, A., & Jablonski, F. 2007, A&A, 465, 993

Hamann, W.-R., Koesterke, L., & Wessolowski, U. 1995, A&AS, 113, 459

Kanarek, G., Shara, M., Faherty, J., Zurek, D., & Moffat, A. 2015, MNRAS, 452, 2858

Marin, L. C., Massey, P., Skiff, B. A., & Farrell, K. A. 2024, AJ, 168, 167

Mauerhan, J. C., Van Dyk, S. D., & Morris, P. W. 2011, AJ, 142, 40

Shara, M. M., Faherty, J. K., Zurek, D., et al. 2012, AJ, 143, 149

van der Hucht, K. A. 2001, , 45, 135