

ACTIVITY IN THE ENVELOPE OF THE G-TYPE HYPERGIANT HD 217476

J.Smoliński<sup>1</sup>, J.L.Climenhaga<sup>2</sup>, and J.M.Fletcher<sup>3</sup>

<sup>1</sup>Copernicus Astronomical Center, Toruń, Poland

<sup>2</sup>Department of Physics, University of Victoria, Victoria, Canada

<sup>3</sup>Dominion Astrophysical Observatory, Victoria, Canada

Yellow hypergiant, HD 217476, (HR 8752) is known to have extensive circumstellar envelope. Its unusual spectrum makes it enigmatic object. On the H-R diagram this hypergiant lies among the most luminous stars known in six Local Group galaxies (Humphreys et al., 1984). We have observed it with the same equipment during last fifteen years at the Dominion Astrophysical Observatory. Our present results are based upon several hundreds of high dispersion spectra (6 and 10 Å/mm). They indicate the following model:

- 1) Hypergiant HD 217476 is the binary system with about 620-days period as derived from the radial velocity curve. The secondary is the B1 V-type star according to the ultraviolet observations by Stickland and Harmer (1978). This binary system is contained in the common expanding envelope and surrounded by the H II region observed at the radio wavelengths (Smoliński, Feldman, and Higgs, 1977) and in the [N II] lines (Sargent 1965).
- 2) The mentioned expanding envelope is very active, what is seen in the line splitting and in the changes of the intensities of the components in H $\alpha$  and in the neutral metallic lines, especially in the Fe I lines. Basing on the three blue-shifted components of neutral metallic lines (with the radial velocities reduced in respect to the binary system, i.e. about 35, 54 and 84 km/s) one can consider three regions or shells in this envelope. We have found that these components are visible as absorption or emission or even disappear depending on the time. However, their radial velocities are rather stationary. As an example, these kinds of activity of the expanding envelope are shown for Fe I  $\lambda$  6430.8Å line in Fig.1 and Fig.2.

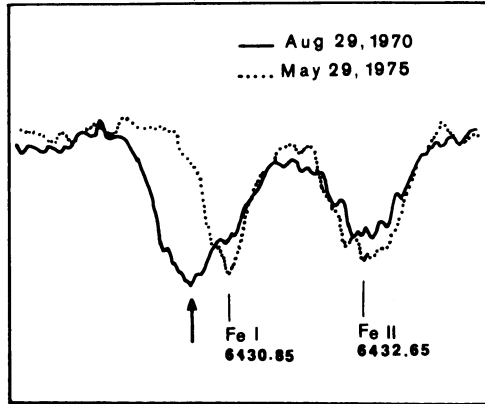


Fig.1 The characteristic changes of the envelope component (from the absorption to disappearance) as shown by arrow.

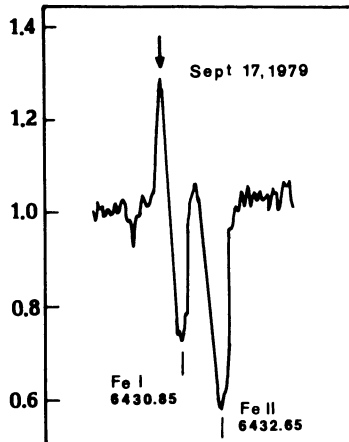


Fig.2 The same as Fig.1 but the change into emission.

It is worth to notice that the proposed model for the hypergiant HD 217476 is supported by the majority of the observational facts obtained from the ultraviolet up to the radio wavelengths.

#### REFERENCES

- Humphreys, R.M., Blaha, C., D'Odorico, S., Gull, T.R., Benvenuti, P., 1984, *Astrophys. J.*, 278, pp. 124 - 136  
 Sargent, W.L.W., 1965, *Observatory*, 85, pp. 33 - 35  
 Smoliński, J., Feldman, P.A., Higgs, L.A., 1977, *Astron. Astrophys.*, 60, pp. 277 - 280  
 Stickland, D.J., Harmer, D.L., 1978, *Astron. Astrophys.*, 70, pp. L53 - L56