

Line profile observations of β Lyrae

© Ernst Pollmann

Emil Nolde Straße 12 - 51375 Leverkusen



24. März 2006

Summary

Observation of phasereferred line profile variations in the binary system β Lyr as reproduction of professional research results.

The system β Lyr is interesting for the amateur particularly because of its continuing variations of the line intensity and line profiles. β Lyr is a binary system, consisting of a primary star of the spectral type B6-8II as well as an early B-star surrounded by a thick accretion disk. Both stars circle a common center of mass whereby the primary star its Roche volume fill out and the overall system is embedded by a cloud of thin H₂-gas (see schematic model below).

A interesting spectral characteristic for amateurs is the periodic behavior of intensity and profile of the H α -emission (Fig.1) of the H₂-gas at 6563Å as well as the emission of HeI at 6678Å (Fig.2).

In dependence of the phase situation in that the binary system is observed (see phase representation below), is the emission maxima as well as the absorption component in profile and strength of different development.

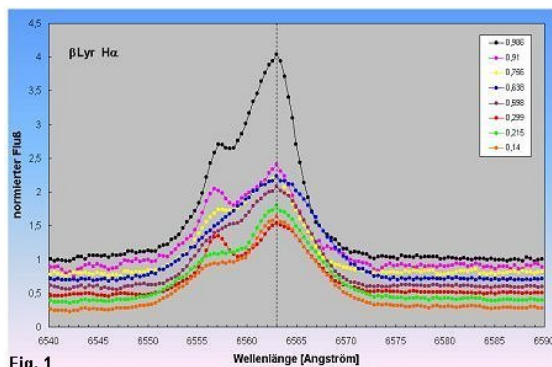
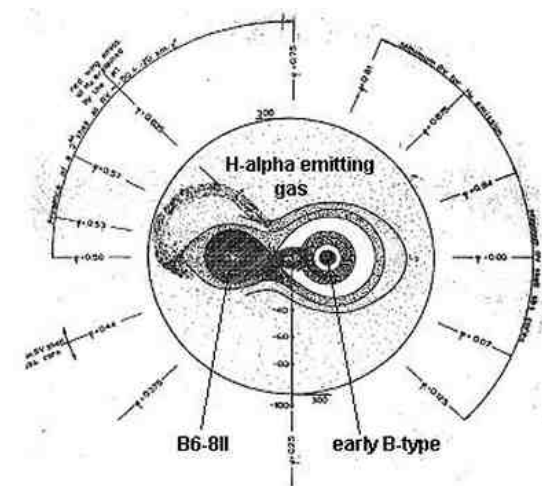


Fig. 1

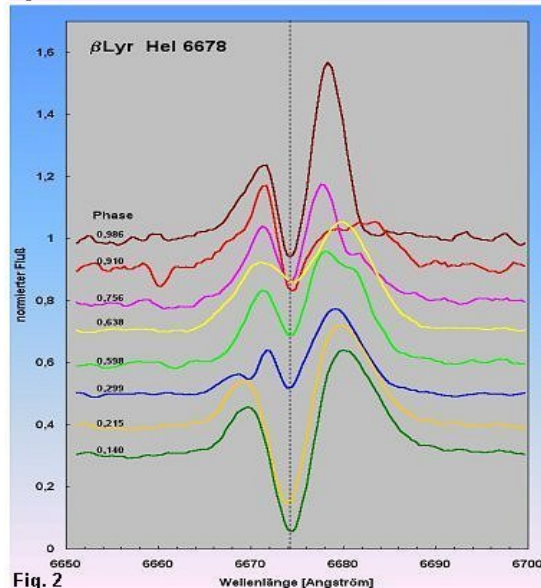


Fig. 2

From view of the present astronomical research β Lyr can be regarded as well understood system. In addition to have contributed substantially the investigations of Flora and Hack (1974) and Harmanec e.a. (1996).

Mass exchange between the components, material jet, accretion disk, light change, all of this are the causes of these spectral characteristics. The spectrum series of the above representation are taken up with grating spectrograph (dispersion = 44Å/mm) at a 20cm Schmidt-Cassegrain-telescope.

References

Flora, U., Hack, M., 1974, A&A. Suppl. 19, 57-89

Harmanec, P. e.a., (1996), A&A, 312, 879-896