

Detection of variable Si-III, Mn-III and Fe-III emission lines in the magnetic Bp star α -Centauri

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The nature of non-variable high-excitation emission lines detected in the optical spectra of normal late-B type and chemically peculiar HgMn and PGa stars is still poorly understood.

To better understand the origin of the weak emission lines in B type stars it is especially important to investigate the spectra of a variety of stars to search for correlations between the emergence of these lines and fundamental stellar parameters.

We have acquired high resolution UVES spectra for the sharp-lined magnetic helium-variable star α -Cen over the rotation period of 8.82d to search for the presence of weak emission lines.

For the first time we present observational evidence for the appearance of variable high-excitation Si-III, Mn-III and Fe-III emission lines in a magnetic Bp star. Si-III emissions are the strongest at the phase corresponding to the maximum strength of He-I lines.

Mn-III and Fe-III emissions vary in antiphase to the He-I lines.

A correlation is found between the probable location of Mn and Fe surface spots and the strength of the emission lines.

On the basis of the currently available data it seems possible that the same kind of selective excitation process is working in the atmospheres of objects within a broad parameter space which could be defined by age, effective temperature, chemical composition, rotational velocity, and magnetic field.

Neutral iron lines previously reported to appear broad and shallow at certain phases are not detected in our spectra, although two of them are identified as He-I forbidden lines, showing maximum strength at the phase of the passage of the He rich region across the visible disk.

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Comments:

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