

THE LI I 6708 FEATURE IN CP STARS*

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ABSTRACT Preliminary results are presented on the behaviour of the feature at 6708 Å ; the location of the observed feature coincides with the doublet of Li I 6707.761 and 6707.912 Å.

The observations were obtained in september 1983 with the Coudé Echelle Spectrometer (CES) of ESO using a Reticon as detector. A spectral range of about 50 Å centred at 6700 Å was covered with a resolution of 10. Raw data were reduced using the standard procedure with the ESO IHAP program package.

The analysis of the stellar spectra was performed with the synthetic spectrum method developed by one of us (F.C.).

The two coolest standard stars show a relatively strong Li feature, and the Li abundance required to reproduce the observed equivalent width is approximately coincident with the upper limit of the Li cosmic abundance, i.e. $\log \epsilon = -9$, for the HD 40136 and only slightly less for HD 739, i.e. $\log \epsilon = -9.56$.

The analysis of the spectra of CP stars was performed using a constant value of $\log g = 4$ and T_e values found in the literature.

Six stars of our sample do not show any detectable line at the predicted Li I wavelength. The spectra of three more stars, HD 3980, HD 25267, HD 220825, are very complex since they are SB2 ; the spectra have not yet been reduced. The spectra of the remaining six stars were compared with the computed ones.

The T_e of HD 15144. (Sr-Cr) is in the range 8400-8800 K. The Li I doublet is absent and an unidentified line is present at 6706.8 Å.

* Based on observations collected at the European Southern Observatory, La Silla, Chile.
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HD 24712 (Sr-Cr-Eu) is one of the coolest Ap stars. Its T is in the range 7300-7500 K. Li I is absent, but the weak line at 6707.45 is present, and may be identified either as Fe I or Sm II.

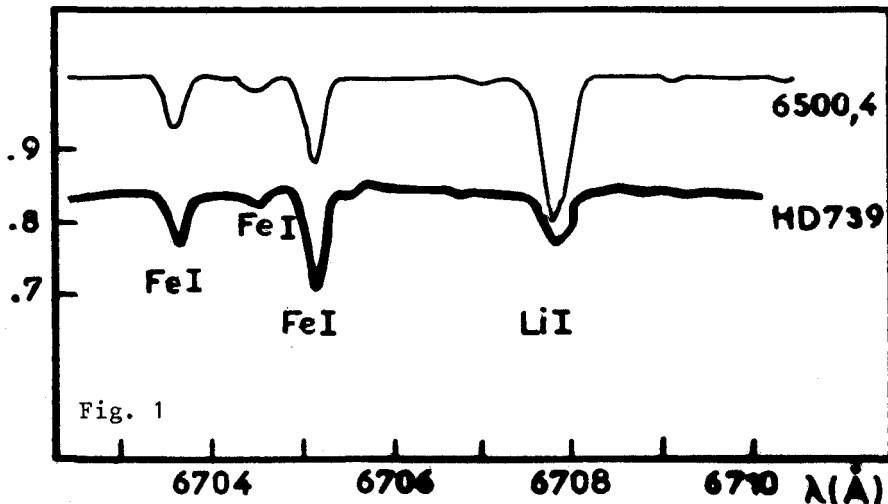
HD 187474 (Cr-Si) is the hottest star of our sample with T_e 12000 K. The observed feature at the lithium position requires a Li abundance of $\log \epsilon = -6.2$, corresponding to more than 600 times the cosmic abundance.

HD 188041 and HD 201601, both classified as Sr-Cr-Eu stars, show a strong asymmetric Li I doublet. The Li abundance required to reproduce this observed feature are $\log \epsilon = -7.1$ and -7.99 for HD 188041 and HD 201601 respectively. Both stars show the same unidentified feature at 6707.0 Å as HD 15144.

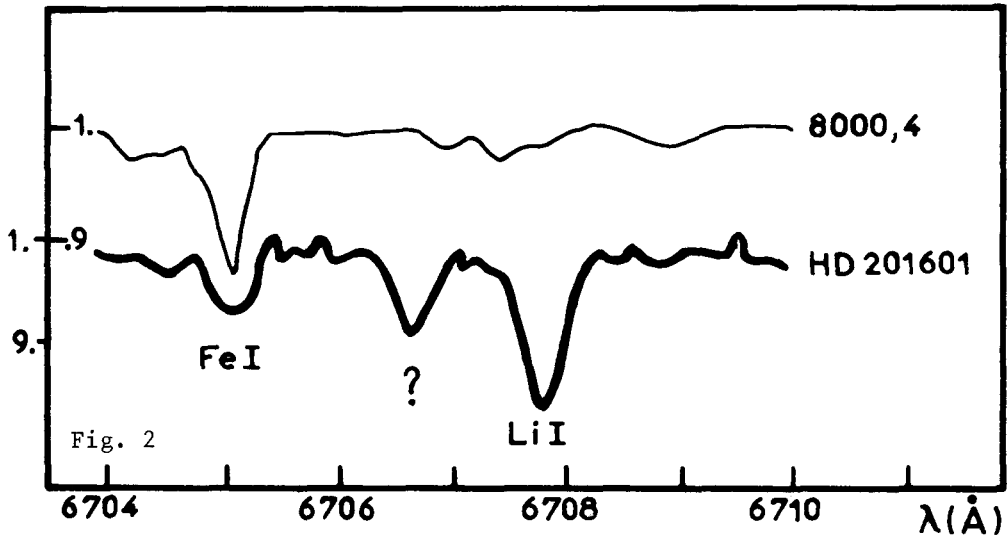
HD 206088, classified either as an Am or as a Sr star, has a $v \sin i$ higher than the previous stars. The lines are broad and shallow and a weak Li I feature may be present.

CONCLUSION Among Cp stars belonging to the Sr-Cr-Eu subclass, the strength of the Li feature appears not to be correlated with the temperature of the stars. The same lack of correlation is found between the 6708 Å feature and the intensity of the magnetic field or the peculiarity parameter Δ (V1-G) of the Geneva photometric system.

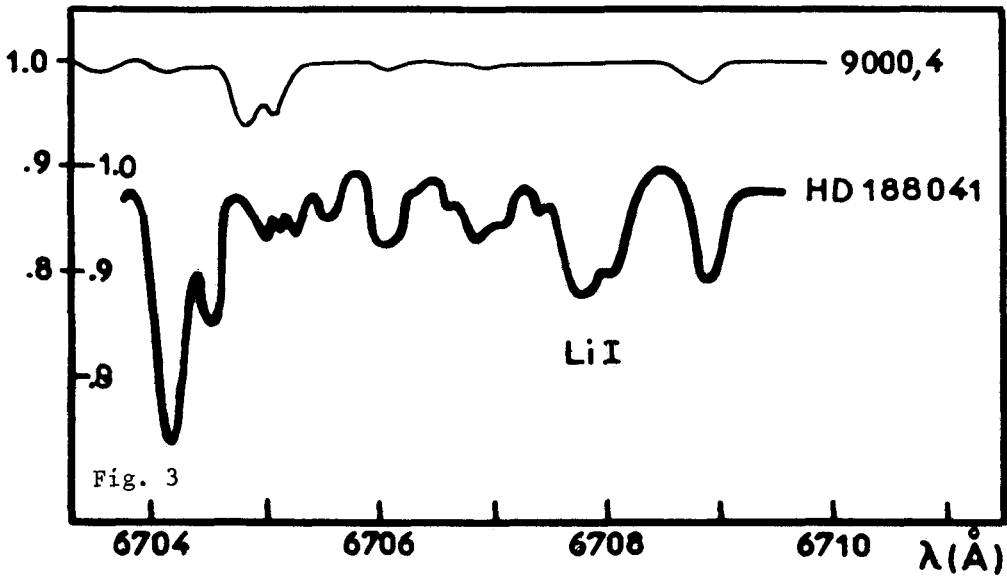
In several stars a higher than cosmic abundance of Li is derived from the 6708 feature.



The spectrum of the standard star HD 739 (F5 V) and the computed spectrum with 6500,4, solar abundances, but $\log \epsilon_{Li} = -9$ (cosmic abundance). The spectra are normalized to the continuum.



The spectrum of HD 201601 (γ Equ) and the computed spectrum with 8000,4 and enhanced metallic abundances (cosmic abundance for Li ; Cr and Sr 100 x ; Re 1000 x ; other elements 10 x). The spectra are normalized to the continuum.



The spectrum of HD 188041 (HR 7575) and the computed one with 9000,4 and same overabundances as for HD 201601. The spectra are normalized to the continuum.