

Preliminary results from investigation of active M and G stars

A. Avramova-Boncheva, A. Antonova, H. Korhonen and I. Stateva

INSTRUMENTATION

NTT telescope La Silla, ESO

EFOSC2 spectrograph

Grism #20 covers H-alpha ($6047\text{--}7147\text{ \AA}$)

Dispersion $0.55\text{ \AA/pixel}$

Spectral resolution ($0.5''$ slit) $\sim 2.0\text{ \AA}$

OBJECTS

GJ729

Sp. type M3.5Ve

P_{rot} 2.87 days

AU Mic

Sp. type M1Ve

P_{rot} 4.86 days

HH Leo

Sp. type G0V

P_{rot} 4.43 days

Spectra per object per night

Time	GJ729	HH Leo	AU Mic
27/06/2023	64	48	23
28/06/2023	61	50	46
29/06/2023	50	0	37
30/06/2023	49	40	34
01/07/2023	46	40	36

Exp. Time

GJ729 – 300 s

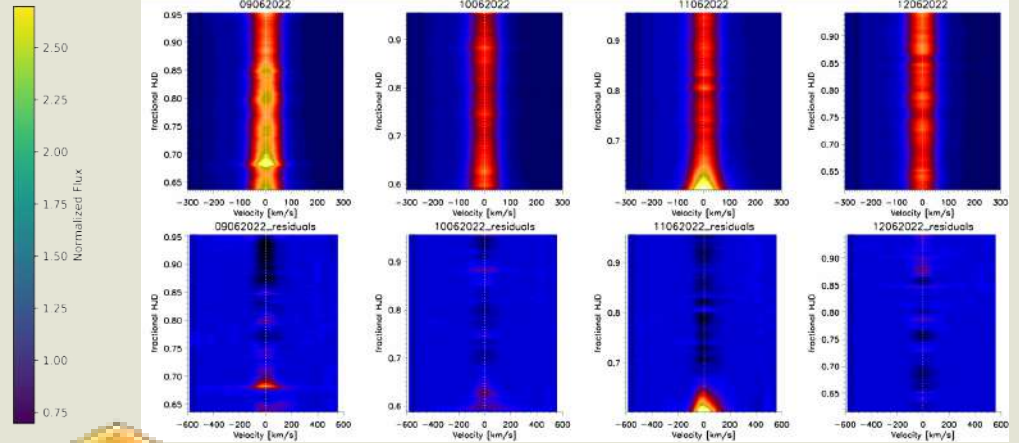
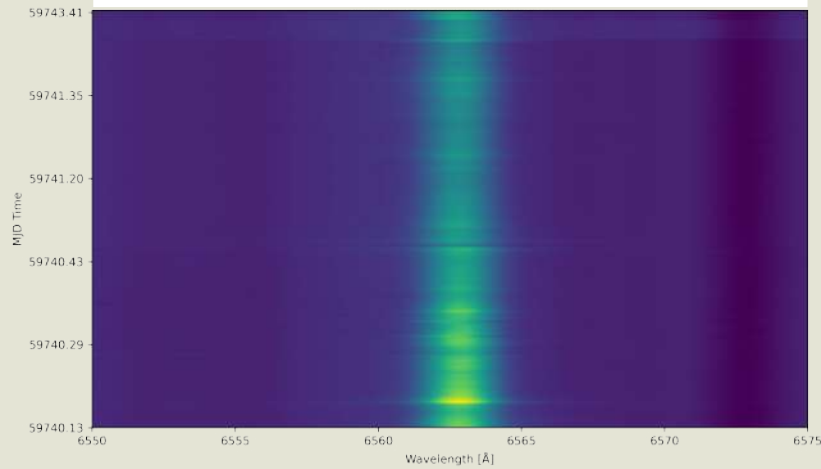
HH Leo – 60 s

AU Mic – 120 s

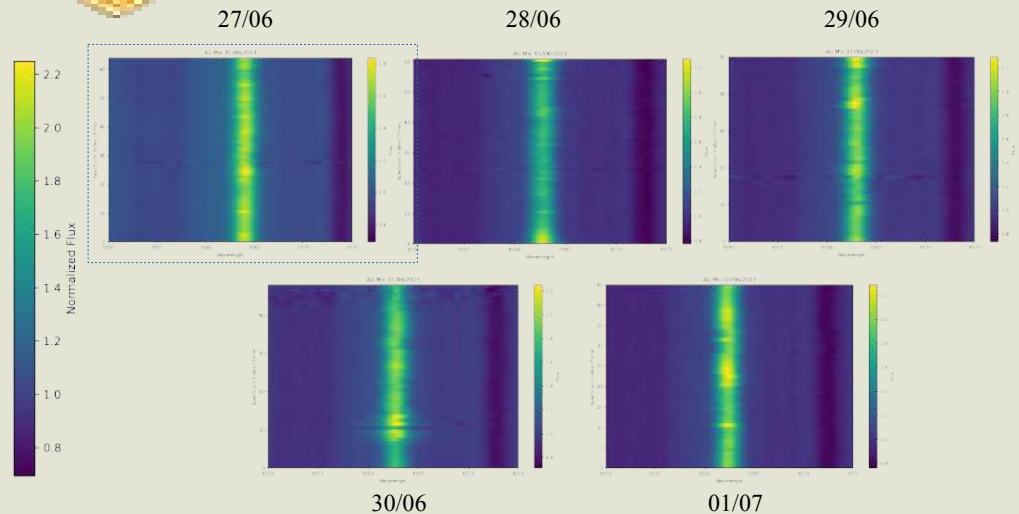
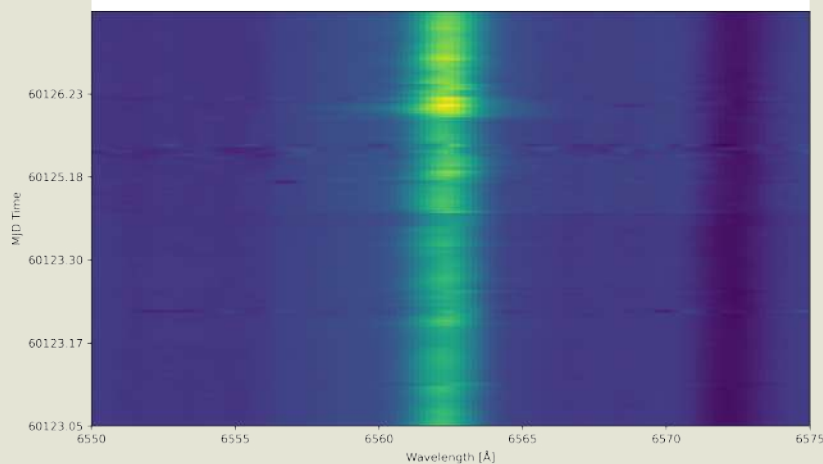
Time-Resolved H-alpha Spectra

GJ729 – Strong variability, possible flaring event

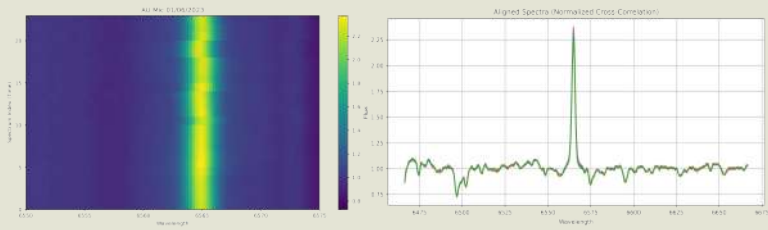
9-12 Jun 2022



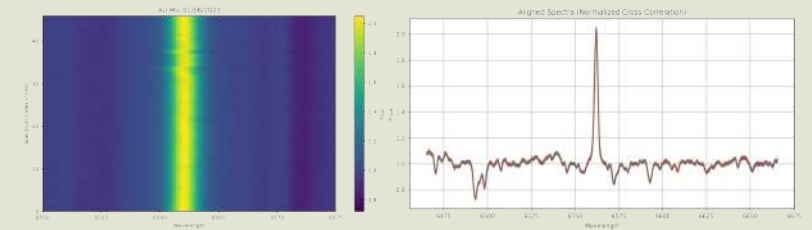
27-30 Jun, 1 Jul 2023



AU Mic – Minor variations, potentially weaker activity

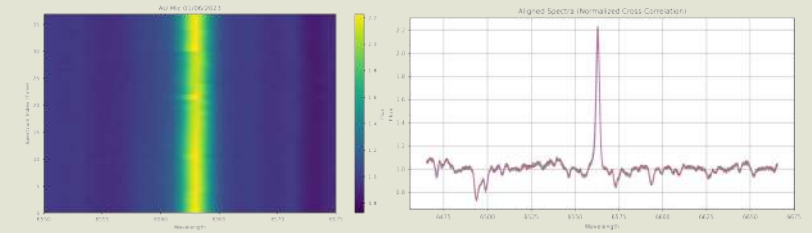
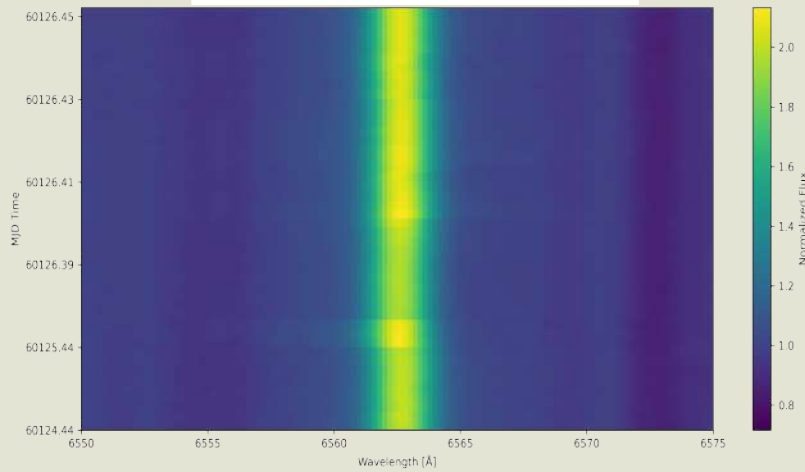


27/06

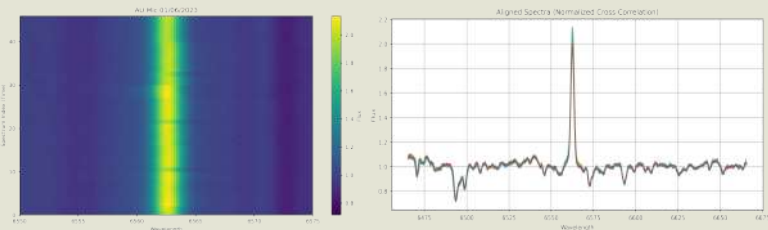


28/06

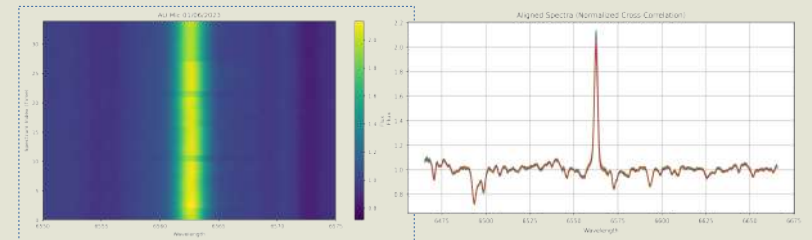
27-30 Jun, 1 Jul 2023



29/06



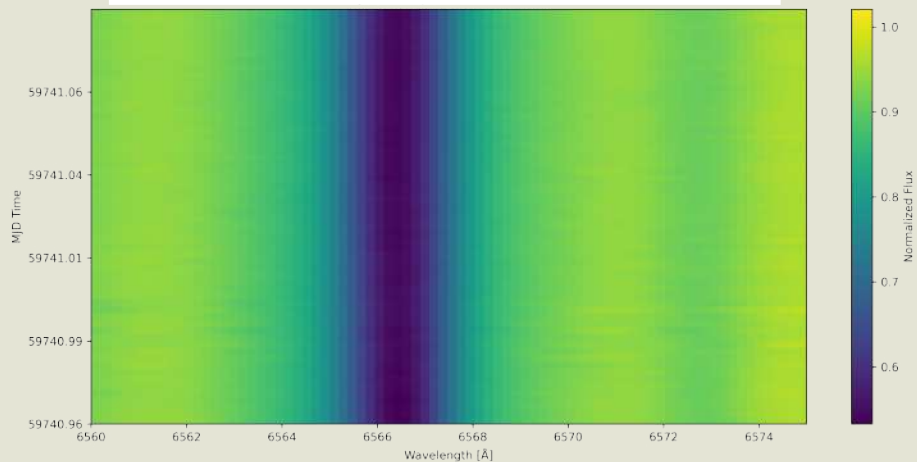
01/07



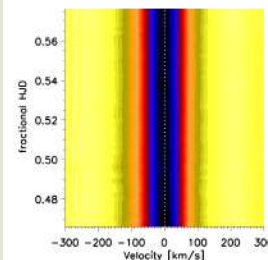
30/06

- HH Leo – Stable absorption profile

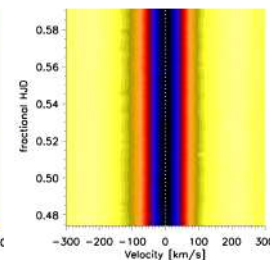
9-12 Jun 2022



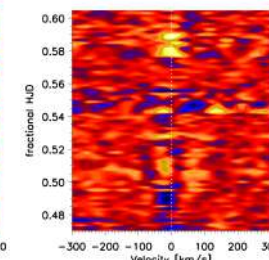
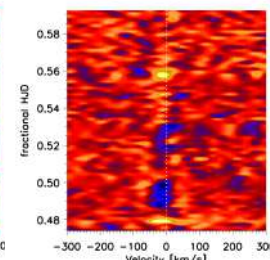
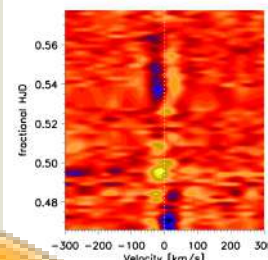
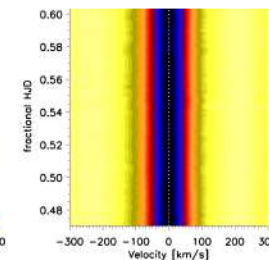
10/06



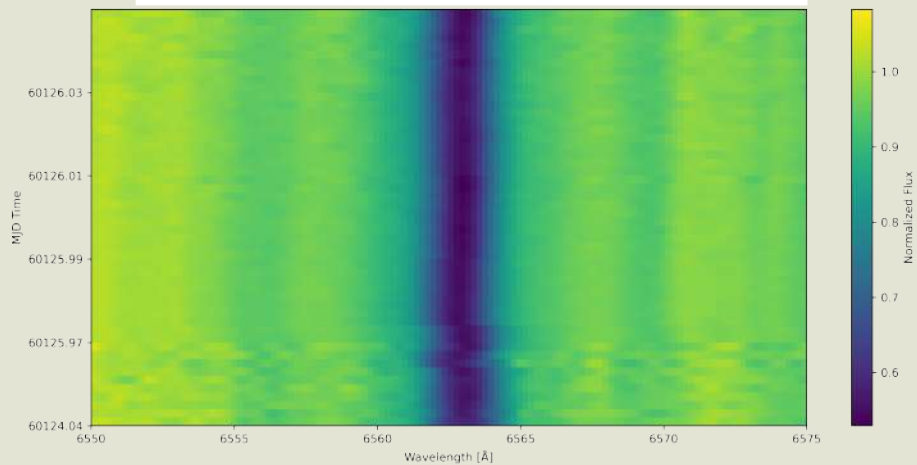
11/06



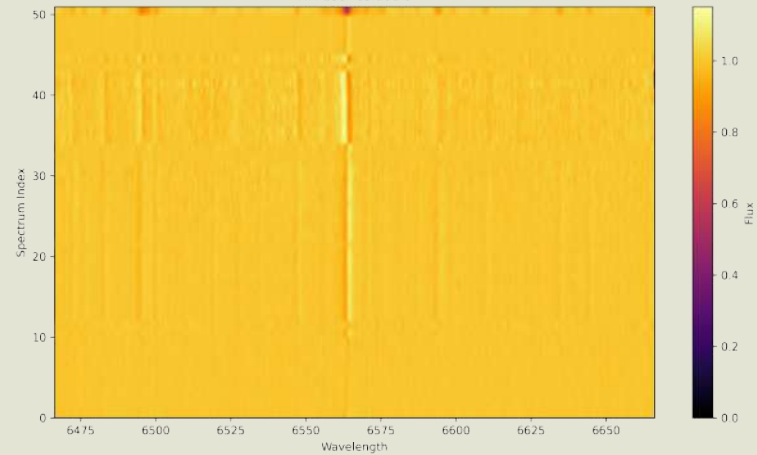
12/06



27-30 Jun, 1 Jul 2023



HH Leo residuals



Findings:

GJ729 shows dynamic H-alpha → strong chromospheric activity.

AU Mic less variable but still active behavior.

HH Leo mostly inactive in H-alpha range.

Future work:

For the purposes of the project, a periodogram analysis will be done for objects AU Mic and HH Leo using TESS data.

Acknowledgements:

This work is supported by the Bulgarian NSF grant No.KP-06-N58/3 (2021). We also acknowledge support from ESO Science Support Discretionary Fund project SSDF21-06.