

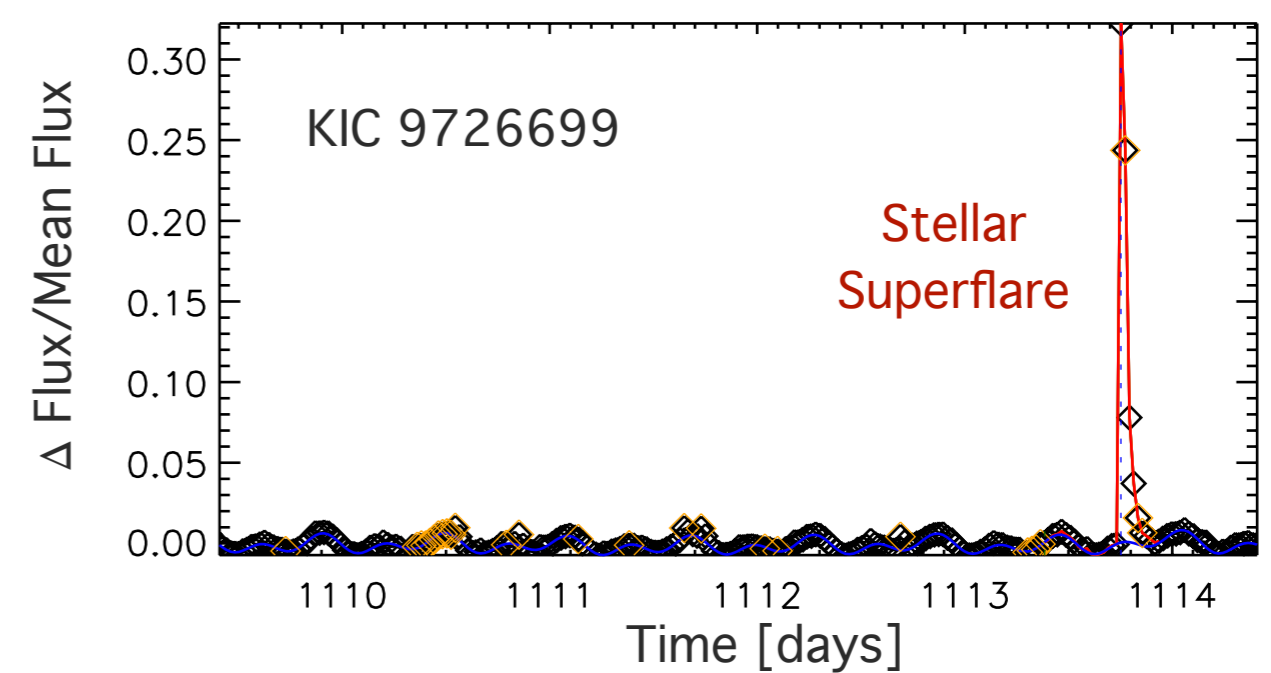
Kanzelhöhe Observatory
Ca II K line

Solar and stellar flare observations

- Understand heating and energy conversion mechanisms at different atmospheric heights
- Probe magnetic structure (Sun) and evolution during flares from polarimetry
- Observe temperature and spectral changes during flares
- Investigate time-dependent energetics

Solar: Acquire spatially-resolved, simultaneous spectra

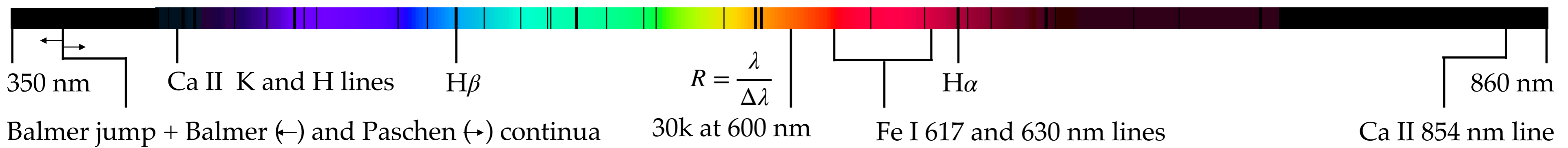
Stellar: Determine intensity, frequency, and duration of M-dwarf flares (e.g. EV Lac, AD Leo, ...)



Kepler light curve of a fast-rotating M-dwarf

5-dimensional observations: spectral, spatial (x,y), polarisation, temporal

Spectral coverage and resolution

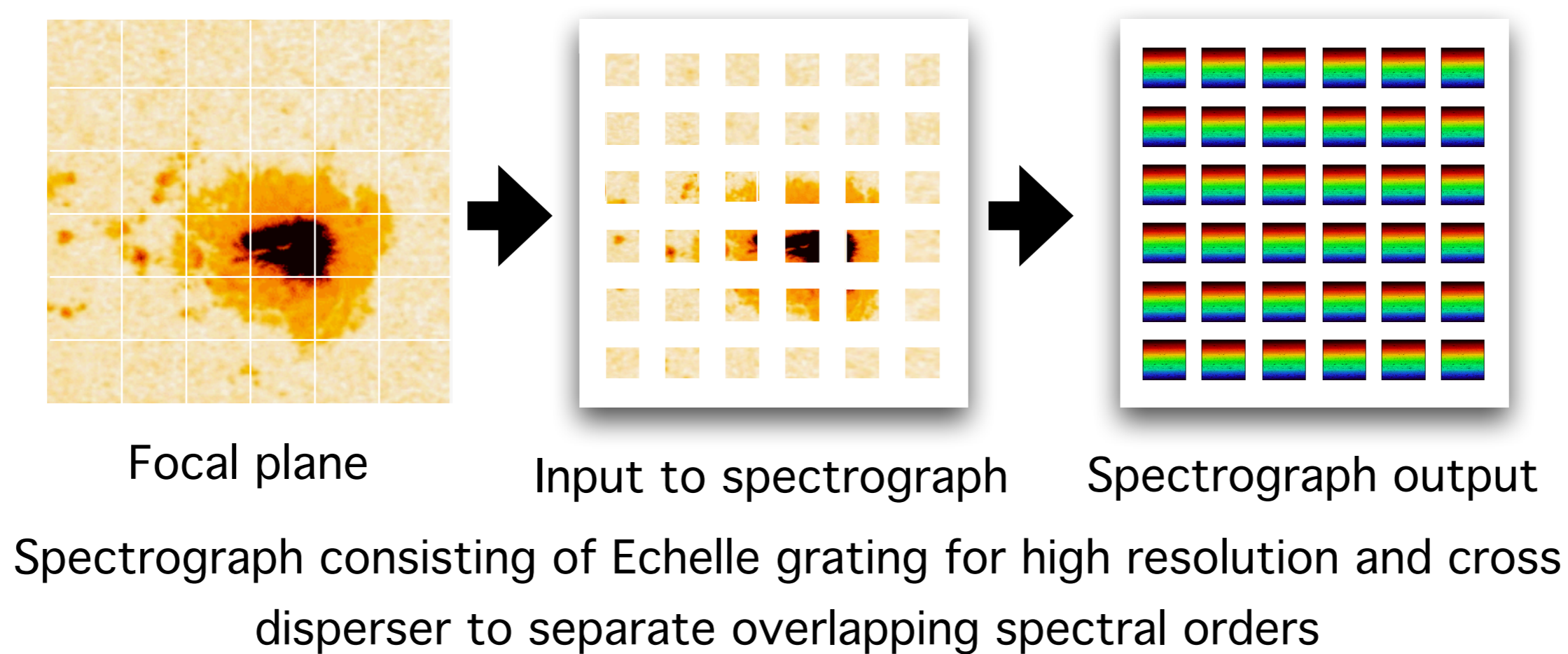


Polarisation

I	Total intensity
Q	
U	
V	

Stokes parameters to be obtained from ferroelectric crystal and beam splitter

Spatial multiplexing with an Integral Field Unit



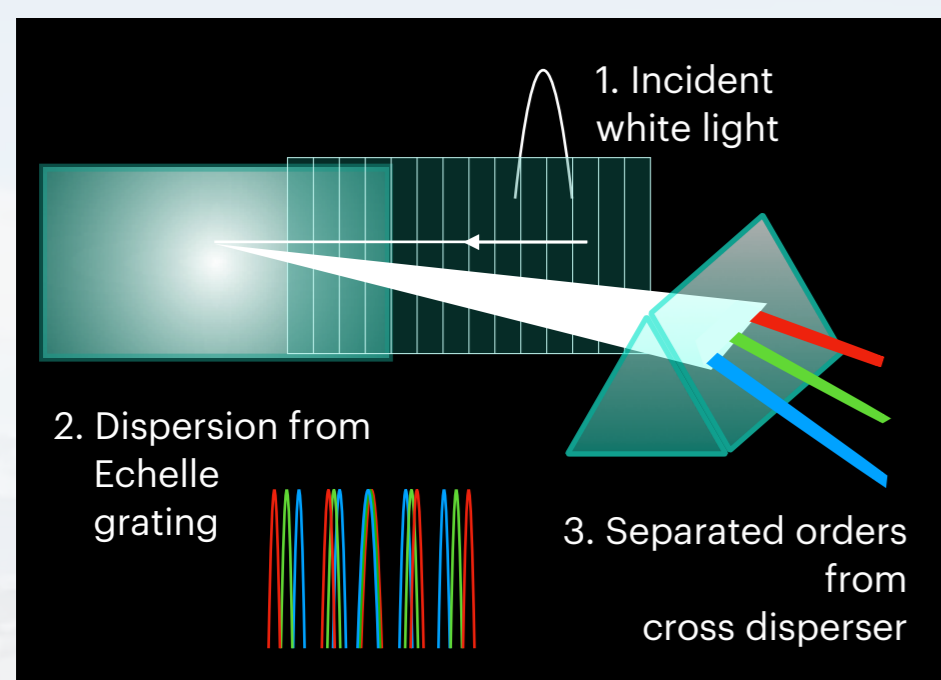
Images: NASA/SDO (sunspot), and N.A. Sharp/KPNO/NOIRLab/NSO/NSF/AURA (Echelle spectra)

Field-of-view

Solar FOV: 60" x 60"
(average sunspot size)
~5" target spatial resolution

Timing

100 frames/s CMOS imager to capture fast temporal changes of lines and continua



Project start

Design and Code V analysis
Dispersion tests
Data pipeline

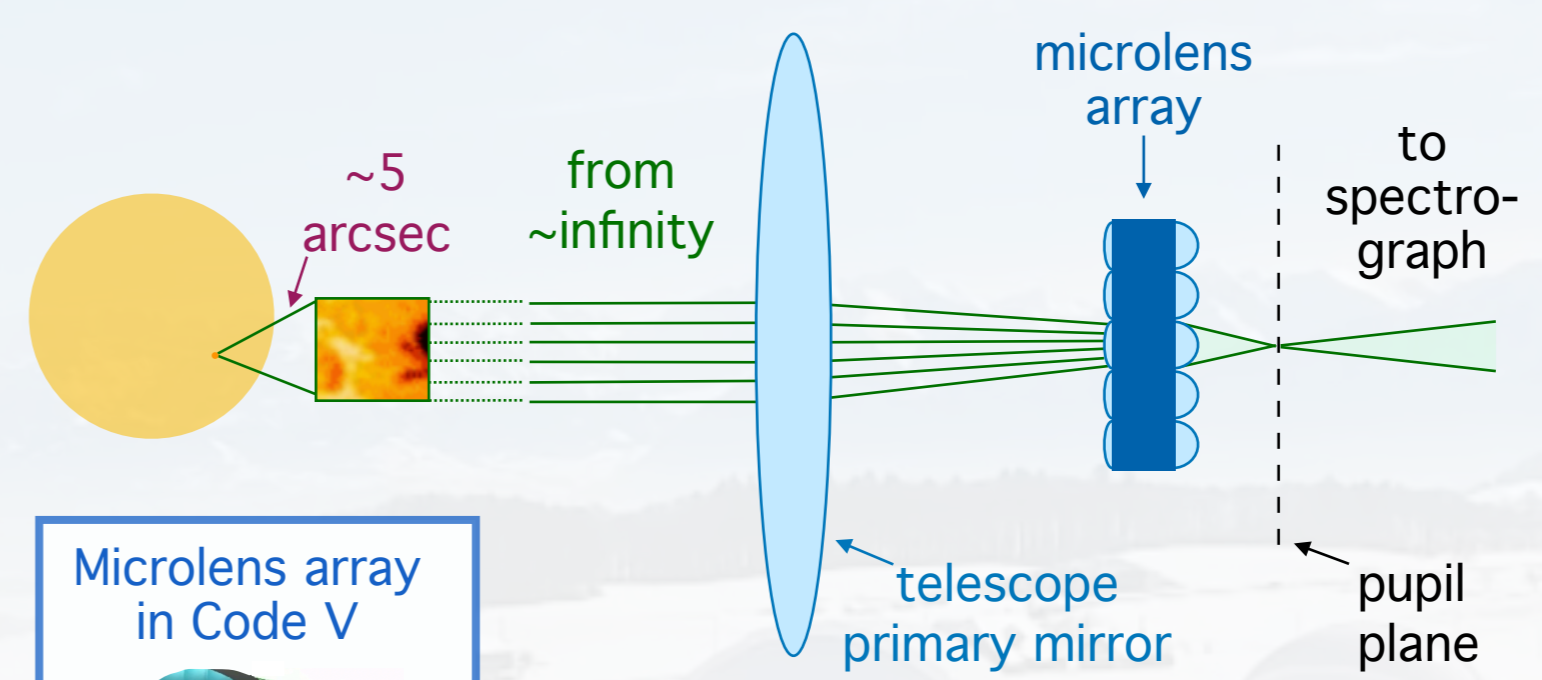


Stellar prototype

Commissioning at Zimmerwald Observatory

Add polarimetry

$$\begin{pmatrix} I \\ Q \\ U \\ V \end{pmatrix}$$



Prototype solar instrument

Calibration campaign and commissioning

Integral field unit development

2024

2025

2026

2027