

# Stellar magnetic field measurements

## Instrumentation

The most successful spectrographs/spectropolarimeters for magnetic field studies include the low-resolution spectrograph FORS 2 installed at the ESO 8-m ANTU telescope on Paranal, the high-resolution spectrograph HARPS at the ESO 3.6-m telescope on La Silla, the SOFIN spectrograph at the 2.56-m Nordic Optical Telescope on La Palma, and the ESPaDOs spectrograph at the 3.6-m CFHT on Mauna Kea. Our group is using these instruments now on a regular basis and this experience will be incorporated in the use of the PEPSI polarimeters at the 2x8.4-m LBT.



FORs 2 is the FOcal Reducer low dispersion Spectrograph at the ESO/VLT.

HARPS is the High Accuracy Radial velocity Planet Searcher at the ESO La Silla 3.6-m telescope.

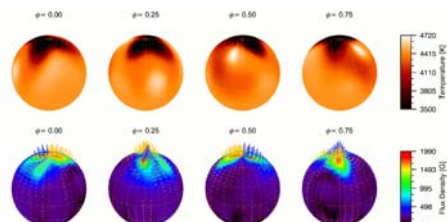


SOFIN is the high-resolution echelle spectrograph mounted at the Nordic Optical Telescope.

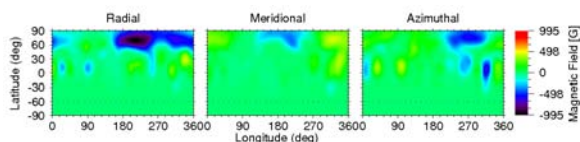
ESPaDOs is a bench-mounted high-resolution echelle spectrograph at the CFHT on Mauna Kea.



## Zeeman-Doppler imaging and magnetic-flux densities of active cool stars and solar-like stars



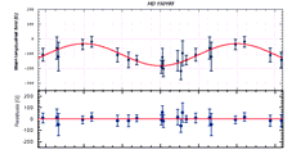
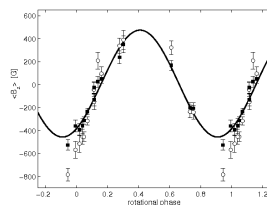
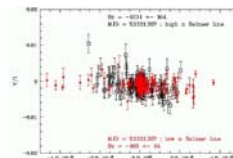
Temperature and magnetic maps of the young star V410 Tau obtained with our own ZDI code iMAP reveal a strong bipolar magnetic field structure in the dark polar region (ESPaDOs).



Mercator plots of three magnetic field components on the surface of the active K2 star II Peg (SOFIN).

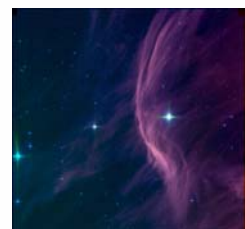
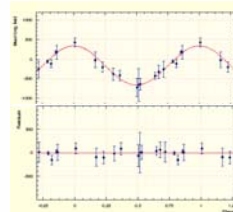
## Understanding intermediate-mass star formation

Magnetic field determination in the outbursting Herbig Ae/Be system Z CMa using high- and low number Balmer lines (FORs 1).



Phase diagrams with the best sinusoidal fits for the longitudinal magnetic field measurements of the Herbig Ae stars HD 101412 (left panel) and HD 150193 (right panel) (FORs 2).

## O stars, $\beta$ Cephei pulsators, and slowly pulsating B stars



Left panel: Phase diagram and residuals for the longitudinal magnetic field measurements of the  $\beta$  Cephei star V1449 Aql. Right panel: Combined IR Spitzer IRAC image of the bow shock around the O9 star  $\zeta$  Oph, for which a magnetic field was recently detected using FORs 1 polarimetric observations.