What can we learn about stellar activity cycles from ZDI?

Victor See
Cool Stars 19, Uppsala
Activity branches

Stars seem to appear on two branches in this parameter space.

Baliunas+95, Saar+98
Activity branches

- Near surface shear layer?
- Active
- Inactive
- Tachocline?

\[ P_{\text{cyc}} \sim 400 \ P_{\text{rot}} \]

\[ P_{\text{cyc}} \sim 90 \ P_{\text{rot}} \]
Zeeman-Doppler imaging

Transition at $Ro \sim 1$

Donati and Landstreet 09
Sample + BCool collaboration

![Graph showing rotation period vs. mass and Rossby number vs. L/L_bol](image)

Rotation period (days)

Mass (M_☉)

L/L_bol

Rossby number

Inactive branch
Active branch

Wright+11, See+(submitted)
Field geometry on branches

Hypothesis:
Active
Inactive
Toroidal
Poloidal

Also see posters:
#34 - Victor See
#233 - Lisa Lehmann

Saar+98, See+15, See+(submitted)
Field geometry on branches

Inactive branch
Active branch

![Graphs showing field geometry on branches](image)
Summary

Field topologies appear to be different along different activity branches

This hypothesis is currently uncertain

Confirmation/rejection will require more ZDI mapping of stars where branches overlap