X-RAY EVIDENCE FOR A POLE-DOMINATED CORONA ON AB DOR

Summary

- Spectral line widths and Doppler shifts in Chandra HETG spectra of the rapidly rotating ~ 30 Myr K0 star AB Dor (P=0.5d, projected rotational velocity 90-100 km s⁻¹) analysed using sensitive FFT and cross-correlation techniques to investigate coronal topology. Analysis performed using PINTofALE IDL software suite freely available from http://hea-www.harvard.edu/PINTofALE

- No significant Doppler shifts found that could be attributed to rotation of coronal structures (Fig. 3). Spectral line widths consistent with thermal broadening and require no rotational broadening (Figs. 4,5); the 1σ limit to rotational broadening implies a compact corona restricted to latitudes > 30° (Figs. 5,6).

- Results present direct spectroscopic evidence that dominant coronal activity on rapidly-rotating active stars is associated with dark polar spots commonly seen in photospheric Doppler images, and support models in which these spots are of mixed magnetic polarity (ie give rise to small-scale magnetic structures).