

## Magnetospheric properties of T Tauri stars through CII], FeII] and SiII] ultraviolet emission lines.

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### Abstract

The C II], Fe II] and Si II] semiforbidden lines are in the range 2320–2340 Å. These emission lines provide a reliable optically thin tracer for measurement of the plasma properties in the magnetosphere of T Tauri stars (TTs). In this work these lines are analysed in a sample of 20 TTs using 30 medium resolution spectra from the Hubble Space Telescope (HST) data archive.

We developed an algorithm in IDL making use of theoretical values of emission line ratios to fit the observed spectra. The procedure provides the properties of the emission region, such as electron density, temperature and line broadening.

For most of the stars in the sample we obtain temperatures from  $10^{4.1}$  to  $10^{4.5}$  K and densities from  $10^8$  to  $10^{12}$  cm<sup>-3</sup>. These stars have suprathermal line broadening (between 35 and 165 km s<sup>-1</sup>), except TW Hya and CY Tau with thermal line broadening. Both C II] line luminosity and broadening are found to correlate with the accretion rate. Line emission seems to be produced in the magnetospheric accretion flow, close to the disk. Three stars (DG Tau, RY Tau and FU Ori) display blueshifted line centroids indicating that the line emission in these stars could be dominated by the outflow.