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The Search for Super-saturation in Chromospheric Emission

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We investigate if the super-saturation phenomenon observed at X-ray wavelengths for the corona, exists in the chromosphere for rapidly rotating late-type stars. Moderate resolution optical spectra of fast rotating EUV- and X-ray- selected late-type stars were obtained. Stars in alpha Per were observed in the northern hemisphere with the Isaac Newton 2.5 m telescope and IDS spectrograph. Selected objects from IC 2391 and IC 2602 were observe in the southern hemisphere with the Blanco 4m telescope and R-C spectrograph at CTIO. Ca II H & K fluxes were measured for all stars in our sample. We find the saturation level for Ca II K at log(L_CaK/L_bol) = -4.08. The Ca II K flux does not show a decrease as a function of increased rotational velocity or smaller Rossby number as observed in the X-ray. This lack of "super-saturation" supports the idea of coronal-stripping as the cause of saturation and super-saturation in stellar chromospheres and corona, but the detailed underlying mechanism is still under investigation.

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