

TEMPERATURE PROFILE OF PULSATING STAR- CC ANDROMEDAE

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The variable star, CC Andromedae is a δ -Scuti type, a short-period pulsating star with a main pulsation period of 0.1249078 days in the constellation Andromeda. Using the 50 cm telescope with a spectrograph at Mount Abu Observatory, Rajasthan, India, the star has been observed in spectroscopy across the whole pulsation cycle with more than 700 low-resolution spectra in the visible region throughout three consecutive days on December 10 to 12, 2016. The initial data reductions, such as flat fielding correction and extraction of spectra, were done using the astronomical software, Image Reduction and Analysis Facility (IRAF). Utilizing the Argon lamp as a reference, the wavelength calibration was done. The spectra were normalized instead of doing flux calibration and spectral lines such as H_α , H_β and H_γ were taken accurately. The equivalent width of a spectral line represents the energy emission of that particular wavelength. Utilizing the Boltzmann equation, the excitation temperature of the pulsating star was calculated by analysing the equivalent width of hydrogen line profiles (H_α , H_β and H_γ). The light curve of CC Andromedae was observed using photometry data obtained from the Transiting Exoplanet Survey Satellite (TESS) mission. The obtained excitation temperature profile was synchronized with the observed light curve of CC Andromedae. The temperature variation was in phase with the brightness variation of the star. Selecting Hydrogen lines with larger wavelength differences gave clearer excitation temperature profiles. This correlation provides further insight into the characteristics and behaviours of CC Andromedae with deeper comprehension.

Keywords: δ -Scuti stars, Excitation temperature, Hydrogen line profiles, Pulsating star