

New multiwavelength observations of the Of?p star CPD -28 2561

S. Hubrig (1), M. Schoeller (2), A. Kholtygin (3), H. Tsumura (4), A. Hoshino (4), S. Kitamoto (4), L. Oskinova (5), R. Ignace (6), H. Todt (5), I. Ilyin (1)

(1) AIP, (2) ESO, (3) St. Petersburg State University, (4) Rikkyo University, (5) Universitaet Potsdam, (6) East Tennessee State University

A rather strong mean longitudinal magnetic field of the order of a few hundred Gauss was detected a few years ago in the Of?p star CPD -28 2561 using FORS2 low-resolution spectropolarimetric observations. In this work we present additional low-resolution spectropolarimetric observations obtained during several weeks in 2013 December using FORS2 (FOcal Reducer low dispersion Spectrograph) mounted at the 8-m Antu telescope of the VLT. These observations cover a little less than half of the stellar rotation period of 73.41d mentioned in the literature. The behaviour of the mean longitudinal magnetic field is consistent with the assumption of a single-wave variation during the stellar rotation cycle, indicating a dominant dipolar contribution to the magnetic field topology. The estimated polar strength of the surface dipole B_d is larger than 1.15kG. Further, we compared the behaviour of the line profiles of various elements at different rotation phases associated with different magnetic field strengths. The strongest contribution of the emission component is observed at the phases when the magnetic field shows a negative or positive extremum. The comparison of the spectral behaviour of CPD -28 2561 with that of another Of?p star, HD148937 of similar spectral type, reveals remarkable differences in the degree of variability between both stars. Finally, we present new X-ray observations obtained with the Suzaku X-ray Observatory. We report that the star is X-ray bright with $\log L_X/L_{bol} \approx -5.7$. The low resolution X-ray spectra reveal the presence of a plasma heated up to 24MK. We associate the 24MK plasma in CPD -28 2561 with the presence of a kG strong magnetic field capable to confine stellar wind.

Reference: MNRAS

Status: Manuscript has been accepted

Weblink: <http://arxiv.org/abs/1412.1658>

Comments:

Email: mschoell@eso.org