

New findings on the prototypical Of?p stars

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In recent years several in-depth investigations of the three Galactic Of?p stars were undertaken. These multiwavelength studies revealed the peculiar properties of these objects (in the X-rays as well as in the optical): magnetic fields, periodic line profile variations, recurrent photometric changes. However, many questions remain unsolved. To clarify some of the properties of the Of?p stars, we have continued their monitoring. A new XMM observation and two new optical datasets were obtained. Additional information for the prototypical Of?p trio has been found. HD108 has now reached its quiescent, minimum-emission state, for the first time in 50--60yrs. The echelle spectra of HD148937 confirm the presence of the 7d variations in the Balmer lines and reveal similar periodic variations (though of lower amplitudes) in the HeI5876 and HeI4686 lines, underlining its similarities with the other two prototypical Of?p stars. The new XMM observation of HD191612 was taken at the same phase in the line modulation cycle but at a different orbital phase as previous data. It clearly shows that the X-ray emission of HD191612 is modulated by the 538d period and not the orbital period of 1542d - it is thus not of colliding-wind origin and the phenomenon responsible for the optical changes appears also at work in the high-energy domain. There are however problems: our MHD simulations of the wind magnetic confinement predict both a harder X-ray flux of a much larger strength than what is observed (the modeled DEM peaks at 30-40MK, whereas the observed one peaks at 2MK) and narrow lines (hot gas moving with velocities of 100--200km/s, whereas the observed FWHM is ~2000km/s).

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Comments:

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