
Modelling surface magnetic fields in stars with radiative envelopes

Oleg Kochukhov*¹

¹Uppsala University – Box 516, SE-751 20 Uppsala, Sweden

Abstract

The stars with radiative envelopes, specifically the upper main sequence chemically peculiar (Ap) stars, were among the first objects outside our solar system for which surface magnetic fields have been detected. Currently, magnetic Ap stars remain the only class of stars for which systematic high-resolution spectropolarimetric observations in all four Stokes parameters are feasible. Consequently, these stars provide unique opportunities to study the physics of polarized radiative transfer in stellar atmospheres, to analyze in detail stellar magnetic topologies and their relation to starspots, and to thoroughly test different methodologies of stellar magnetic field mapping. In this talk I will present an overview of different approaches to modelling the surface fields in magnetic A- and B-type stars. In particular, I will summarize ongoing work to interpret full Stokes vector high-resolution spectra of these stars using magnetic Doppler imaging. These studies have revealed an unexpected complexity of the magnetic field geometries in some of Ap stars.

*Speaker