# Four numerical approaches to solve the radiative transfer equations in magnetized white dwarf atmospheres

Stefan Jordan (1,2), Holger Schmidt (2)

*(1) Institut für Astronomie und Astrophysik, Eberhard-Karls-Universität, Sand 1, D-72076 Tübingen, Germany, (2) Institut für Theoretische Physik, Christian-Albrechts-Universität, D-24098, Kiel, Germany*

The observed spectrum and wavelength dependent polarization of magnetic white dwarfs can be analyzed by simulating the transport of polarized radiation through a magnetized stellar atmosphere.

The four coupled radiative transport equations for the Stokes parameters $I$, $Q$, $V$, and $U$, can be solved by different numerical approaches. In this talk the numerical results and efficiencies of four different methods are discussed: (a) the method of Wickramasinghe & Martin which assumes that the source function is linear in the optical depth and that between two successive depth points the Stokes parameters can be described by exponential functions; (b) accelerated $\Lambda$ iterations (see also the talk by J. Deetjen) (c) an approximation for large Faraday rotation, and (d) the matrix exponential solutions.