ON THE STARK BROADENING OF Cr II $3d^5$ - $3d^4 4p$ LINES IN STELLAR ATMOSPHERES

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Chromium lines are interesting due to their presence in stellar atmospheres. They have been identified in stellar spectra, as for example o Peg, 7 Sex, and φ Aqu, in which spectrum Caliskan and Adelman identified 28 Cr II spectral lines and noted overabundace with value log Cr/H = -5.85±0.27. Consequently, data on the Stark broadening of single ionized chromium spectral lines are of interest not only for laboratory but also for astrophysical plasma research. Of particular interest are resonance lines, since they are often present in stellar spectra.

We analyze here, the importance of Stark broadening effect for Cr II $3d^5$ - $3d^4 4p$ transitions in stellar atmospheres.

STARK BROADENING OF B IV

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The light elements lithium, breryllium and boron are of particular interest since they undergo nuclear reactions at relatively low temperatures reached in the solar-type stars outside the core, so that their circulation and destruction can produce observable changes in abundances, providing informations on stellar structure and mixing by convection. Boron lines are observed in Sun and stars. For example Proffitt and Quigley (2001) studied B III 2065.8 Å resonance line in 44 early B type stars determining the abundance of boron. In this work we will determine within the impact approximation, by using the semiclassical perturbation theory, Stark broadening parameters for B IV lines,

needed for stellar plasma research and modelling, as well as for a number of research topics in plasma physics. The obtained data will be used to investigate the influence of Stark broadening of spectral lines in stellar atmospheres.

CALCULATION OF STARK BROADENING OF SEVERAL Ne I LINES FOR ASTROPHYSICAL PURPOSES

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Neon lines are present in stellar spectra and due to its high cosmical abundance, as well as to the fact that carbon burning in stellar interiors produces oxygen-neon-magnesium cores, this element is particularly interesting for astrophysical plasma research, including the Stark broadening of lines in its spectrum. For example the Solar abundance of neon is the largest after H, He, O and C. Here, we will investigate Stark broadening of neon spectral lines within the series $2p^5 3p\ ^2[5/2]_3 – 2p^5 nd\ ^2[7/2]^\circ_4$. The new Stark broadening parameters will be determined using the semiclassical perturbation approach and the impact approximation. The obtained results will be used for the investigations of regularities and systematic trends of Stark broadening parameters within a spectral series and for the investigation of the influence of Stark broadening in stellar spectra.