

Stark Broadening Influence on Astronomical Spectra

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Abstract

Stark broadening or broadening of spectral lines by collisions with charged particles is considered here, from the point of view of applications in astronomy. It is of interest especially for analysis and synthesis of hot star (A and B type) spectra, the research of white dwarfs and even cooler star atmospheres as e.g. Solar one. Namely, the influence of Stark broadening within a spectral series increases with the increase of the principal quantum number of the upper level and consequently, Stark broadening contribution may become significant even for the Rydberg lines in the Solar spectrum. This broadening mechanism is also of significance for the research of neutron stars and the investigation of radio recombination lines from molecular and ionized hydrogen clouds.

Stark broadening parameters are also needed for the determination of the chemical composition of stellar atmospheres i.e. for stellar elemental abundances determination from equivalent widths of absorption lines, estimation of the radiative transfer through the stellar plasmas, especially in subphotospheric layers, and for opacity calculations, radiative acceleration considerations, nucleosynthesis research and other astrophysical topics.

Here will be reviewed and discussed astronomical applications of Stark broadening, as well as the results of Stark broadening study in Serbia, relevant to astrophysical problems.

Kinematics in the Central Broad-Line Region of AGN

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Abstract

First of all, I will review general ideas about the central line emitting region in active galactic nuclei (AGN). After that I will introduce some basic facts what about can be learned from continuum and emission-line intensity variations. Finally I will introduce the 2D-reverberation mapping method.

Comparing line profile variations with theoretical models we can get information about structure and kinematics of the innermost Broad-Line Region in AGN.