ASTROPHYSICAL SPECTROSCOPY: RESEARCH ON SPECTRAL LINE SHAPES

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Data on spectral line shapes are of importance for a number of problems concerned to research and modelling of various astrophysical and laboratory plasmas, as well as for inertial fusion, laser produced and technological plasmas investigations, modelling and the corresponding spectrum synthesis and analysis. Also, such data are of interest for designing of laser equipment. For example in astrophysics, data on the broadened spectral lines are needed for radiative transfer investigations, analysis and synthesis of spectra of astrophysical plasmas and modelling, spectroscopic diagnostics and determination of optical characteristics of stellar atmospheres and envelopes, as well as for determination of the temperature in particular atmospheric layers, the chemical composition of stellar plasma, surface gravity, spectral type and effective temperature.

We will review here the neeeds for line broadening data, with an accent on astrophysical applications and the line broadening due to the influence of collisions with charged particles on emitting/absorbing atoms and ions, so called Stark broadening. We will also review the recent work in this research field on Belgrade astronomical observatory and inclusion of such data in STARK-B database (http://stark-b.obspm.fr/), Virtual Atomic and Molecular Data Center (VAMDC - http://www.vamdc.org/) and Serbian Virtual Observatory (SerVO - http://servo.aob.rs/).