

Chair of Physical Electronics

Plasma, Spectroscopy, Stark parameters, Ion-Molecule collisions, UV radiation

The main objectives and topics are directed to the plasma spectroscopy and plasma diagnostics. The work is mainly devoted to determination of Stark parameters of different atomic and ionic lines with the purpose of using it for plasma electron density determination. Furthermore, the members of the chair worked in the field of RF plasma sources, plasma dynamics, measurements of transition probabilities in atoms and ions, effects of ion dynamics on plasmas as well as the effects on Debye screening effect. The great part of the work is devoted to the hydrogen spectral lines and plasmas. Experiments are done using two plasma sources: the T-tube as pulsed plasma source and the wall stabilized electrical arc which can work in DC and pulsed regime when higher plasma electron densities are reached.

In addition, some members of the group work on measurements of absolute cross sections of ion-molecule collisions at energies up to 10 eV that are of great interest for fundamental physics, astrophysical plasmas and in general for plasma modeling.

One of the research topics is monitoring solar UV radiation and stratospheric ozone layer thickness and artificial UV sources.



SELECTED EQUIPMENT

- Plasma sources with spectroscopy equipment (high resolution fast ICCD camera, 1-m monochromators etc)
- NOVIon – Guided Ion Beam instrument for measurements of absolute cross sections between ions and neutrals
- Instruments for monitoring solar UV radiation and ozone layer thickness
- Simulator of solar UV radiation
- Different electronic instruments (DC and AC sources, oscilloscopes, function generators, spectrum analyzers, high voltage DC sources etc)

CONTACT PERSONS

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SELECTED PROJECTS

Title: *Determination of atomic regularities Stark parameters for np-nd transitions in the homologous series of ionized noble gases (FIS205-03155)*

Type: Scientific. Plasma physics

Duration: 2006 - 2008

Contact person: Stevica Djurović

Title: *Spectroscopic diagnostics of low-temperature plasmas and gas discharges: Spectral line shapes and interaction with surfaces (NIO 171014)*

Type: Scientific. Plasma physics

Duration: 2011 -

Contact person: Stevica Djurović

Title: *Astrophysics and plasma relevant experimental studies of hydrogen and helium chemistry in high and low temperature ion traps and guides (SCHL 341/17-1)*

Type: Scientific. Collisional cross section measurements for atoms, ions and molecules

Duration: 2017 - 2019

Contact person: Igor Savić

COLLABORATIONS

- Faculty of Sciences, University of Valladolid (Spain), Experimental investigations in plasma spectroscopy
- CORIA French combustion laboratory, University of Rouen (France), Experimental investigations in plasma spectroscopy
- Institute of physics I, University of Cologne (Germany), Collisional cross section measurements

