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eds. Milan S. Dimitrijević and Luka Č. Popović

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INVITED LECTURES

Invited lecture

THE BROADENING OF SPECTRAL LINES BY COLLISIONS WITH NEUTRAL HYDROGEN ATOMS IN COOL STARS

P. S. Barklem

Uppsala University
Box 515, S75120 Uppsala, Sweden
e-mail: barklem@astro.uu.se

I will review the theory of broadening of metallic spectral lines by neutral hydrogen atom collisions developed by Anstee, Barklem and O'Mara. I will discuss why the theory works, while able to retain the wide range of applicability needed for astrophysical applications. I will discuss the present status of large scale calculations for many spectral lines for neutral and singly ionised species. Some examples of application to analysis of cool star spectra will be discussed. Time permitting, the extension of the theory to self broadening of hydrogen lines will be discussed briefly.

Invited lecture

EXPERIMENTAL AND THEORETICAL DETERMINATION OF TEMPERATURE IN PLASMAS

N. Ben Nessib

Institut National des Sciences Appliquées et de Technologie,
University of 7 November at Carthage, Centre Urbain Nord B.P. 676,
1080 Cedex Tunis, Tunisia
e-mail: nebil.bennessib@planet.tn

When plasma is in thermodynamic equilibrium, all species has the same temperature T. In practice, plasmas are generally not in equilibrium, so different temperatures can be obtained:
We define kinetic temperature for particles having a mass m and a velocity v distributed around v by the Maxwell law. Using the Boltzmann law, giving repartition in the different states of an atom, we obtain the excitation temperature T_{exc} and using the Saha equation, we derive the ionisation temperature. The electronic temperature T_e is obtained by the classical kinetic gas theory; using the ion mass instead of the electron mass we deduce the ionic temperature T_i.
Radiation temperature T_{rad} is obtained using the Planck law. In a complete thermodynamic equilibrium CTE, we have equality of all these temperatures ($T_{cin} = T_{exc} = T_{ion} = T_e = T_i = T_{rad}$). The electronic temperature Te can be obtained using spectral lines broadening. For example, when the Doppler effect is predominant, the width of lines is proportional to the square root of T_e. Using the hydrogen lines, we can found tables and empirical laws giving relations between widths and T_e for an electronic density condition of plasma.

Some authors use noble gas lines for determining T_e. The first common and useful behaviour law of the width is an inverse proportional law to the root square of temperature; this law was performed by a power one. But this can not be a general law, because in some lines, the width increase with temperature and more consistent laws are developed relating the temperature variation with the structure of the emitter.

Invited lecture

ABSORPTION LINE DIAGNOSTICS OF QUASAR OUTFLOWS

G. Chartas

Penn State University
525 Davey Lab, University Park, PA 16802
chartas@astro.psu.edu

Recent XMM-Newton, Suzaku, and Chandra observations of quasars suggest the presence of high velocity outflows of ionized absorbing material with velocities up to 0.4c. Quasar winds might be more powerful than what we previously thought. X-ray absorption lines produced by outflowing material detected in several quasars is possibly probing a highly ionized and high velocity component of the accretion disk wind that appears to be distinct from the absorbers detected in the optical and UV wavebands. We will present constraints on the properties of the outflowing wind such as velocities, launching radii, column densities, ionization state and variability. Assuming the interpretation that the high-energy absorption features arise from highly ionized Fe we find that the mass outflow rates in these objects are comparable to the estimated accretion rates of a few M^{-}/yr and are considerably higher than those based on the wind properties derived from UV BALs.

Invited lecture

ON THE BROADENINGS OF SPECTRAL LINES IN SURFACE WAVES DISCHARGES

M. Christova[1], L. Christov[2]

[1]*Department of Applied Physics, Technical University-Sofia,*
BG-1000 Sofia, Bulgaria
[2]*Faculty of Chemistry, Sofia University, BG-1164 Sofia, Bulgaria*
e-mail: mchristo@tu-sofia.bg, christov@chem.uni-sofia.bg

The broadenings of argon spectral lines emitted in surface waves discharges are examined in the pressure range 1 Torr – 1 atm. The different mechanisms of broadening are studied. Interpretation of experimental results is discussed. The study is of interest for plasma diagnostics.

Invited lecture

THE DACs AND SACs EFFECTS FROM STARS TO QUASARS. SOME FIRST GENERAL NOTICES

E. Danezis[1], L. Č. Popović[2], E. Lyratzi[1], M. S. Dimitrijević[2]

[1]*University of Athens, Faculty of Physics, Department of Astrophysics, Astronomy and Mechanics, Panepistimioupoli, Zographou 157 84, Athens, Greece*
[2]*Astronomical Observatory, Volgina 7, 11160 Belgrade, Serbia*

The spectra of Hot Emission Stars and AGN present peculiar profiles that result from dynamical processes such as accretion and/or ejection of matter from these objects. In this paper we explain the idea of DACs and SACs phenomena, as a reason of spectral lines peculiarity in Hot Emission Stars and AGN. We present the line function of a kinematical model enabling us to study the physical parameters of the density regions in the plasma surrounding of the studied objects, where DACs and SACs of a spectral line are created, producing the observed peculiar profiles. Using this model, we study some AGN spectral lines and we present an analysis of the physical parameters of the regions that these spectral lines arise from. We also present some first general conclusions, derived from the proposed model, including the relations among the physical parameters of the density regions of the plasma surrounding the Oe stars, where DACs and SACs are created, producing the observed peculiar profiles. Finally we present a first comparison of DACs and SACs phenomena between Be and Oe stars.

Invited lecture

PROFILES IN NOVAE SPECTRA

J. Danziger

INAF/OAT and Dept.of Astronomy, University of Trieste, Italy
e-mail: danziger@oats.inaf.it

The old novae RR Telescopii shows emission lines due to Bowen fluorescence in OIII and NIII. To explain the presence of the many lines arising from this mechanism that have now been observed it is necessary to understand the role of line broadening in the pumping lines produced by multiple scatterings and creating huge optical depths in these lines. This novae provides a clear demonstration of these principles because all the necessary ingredients are present.

Invited lecture

SDSS SPECTROSCOPIC SURVEY(s)

Z. Ivezić

University of Washington
Deptartment of Astronomy, Box 351580, Seattle, WA 98195, USA
e-mail: ivezic@astro.washington.edu

In addition to optical photometry of unprecedented quality, the Sloan Digital Sky Survey (SDSS) is also producing a massive spectroscopic database. The SDSS spectra have a wavelength coverage from 3800 to 9200 Å, with a resolution of about 2000. The recent Data Release 5 includes spectra for over 150,000 stars and nearly a million extragalactic objects. I will discuss a subset of science results based on the analysis of SDSS spectra, including kinematics and metallicity distribution of the Milky Way stars, determination of the stellar mass of galaxies, and a sample of AGN with unusual line profiles.

Invited lecture

CHEMI-IONIZATION PROCESSES: ALKALI-METAL GEOCOSMICAL PLASMAS

A. N. Klyucharev[1], N. N. Bezuglov[1], A. A. Matveev[1],
A. A. Mihajlov[2], Lj. M. Ignjatović[2], M. S. Dimitrijević[3]

[1]*St Petersburg State University / Research Institute of Physics,*
1, Ulyanovskaya ul., Peterhoff, St. Petersburg, 198504, Russia
[2]*Institute of Physics, P.O. Box 57, 11001 Belgrade, Serbia*
[3]*Astronomical Observatory, Volgina 7, 11160 Belgrade, Serbia*

Chemi-ionization processes in thermal and sub-thermal collisions of excited alkali atoms with atoms in ground and excited states were considered, with a particular accent to the applications for geocosmical plasma research. An improved version of semi-classical method for the rate coefficients calculation is presented. The method is applied to the cases of excited alkali atoms with the principal quantum numbers $5 \leq n \leq 25$. The results of calculations of the considered chemi-ionization processes rate coefficients are compared to the existing experimental data. Their good mutual agreement recommends them for analysis of geocosmical plasma processes.

Invited lecture

LINE PROFILE VARIABILITY IN AGN

W. Kollatschny

Institut für Astrophysik Göttingen,
Georg-August Universität Göttingen, Germany
e-mail: wkollat@astro.physik.uni-goettingen.de

I will review some key aspects of the central line emitting region in AGN. Continuum and emission line variability provides a powerful tool to map the structure of the central broad line region (BLR). Observed delays of the emission lines of the order of days to weeks probe regions only microarcseconds away from the nucleus. I will discuss different methods to derive the central mass of the supermassive black holes in AGN. Finally, the 2D-reverberation mapping method applied to variable line profiles gives us information on geometry and velocity in the innermost BLR.

Invited lecture

THE JET-CLOUDS INTERACTION IN AGN: A PANORAMIC SPECTROSCOPY VIEW

A. V. Moiseev, A. A. Smirnova, V. L. Afanasiev

Special Astrophysical Observatory of RAS
Nizhnij Arkhyz, Zelenchukskaya, Karachaevo-Cherkesia,Russia 369167
e-mail: moisav@sao.ru

The powerful of 3D (panoramic) spectroscopy is demonstrated on the examples of active galactic nuclei observations. We have study a jet-clouds interaction in the case of object with different size of radio jets: from several hundreds parsecs to tens kiloparsecs.

Invited lecture

STUDIES OF LOCAL MILKY-WAY KINEMATICS VIA LINE-OF-SIGHT VELOCITIES

S. Ninković

Astronomska opservatorija, Volgina 7, 11160 Beograd 74, Serbia
e-mail: sninkovic@aob.bg.ac.yu

A review of the studies concerning the local Milky-Way kinematics which have used line-of-sight velocities of stars is given. This review comprises historical aspects, methodics and perspectives as well.

Invited lecture

ELECTRON, ION AND ATOM COLLISIONS LEADING TO ANOMALOUS DOPPLER BROADENING IN HYDROGEN AND HYDROGEN RARE GAS MIXTURES

Z. Lj. Petrović, V. Stojanović, Ž. Nikitović

Institute of Physics, University of Belgrade, POB 68, 11080 Zemun, Serbia
e-mail: zoran@phy.bg.ac.yu

The first interpretations of unusually high Doppler broadening of hydrogen lines in non-equilibrium plasmas were based on possible dissociative processes, recombination and excitation (Capelli et al. 1985). The experiments, especially the experiments performed in Dc fields revealed a large asymmetric component with energies often exceeding the energy available from the repulsive potentials of the dissociating molecules (Barbeau and Jolly 1990; Konjević and Kuraica 1992). The explanation of such results was sought and found on the basis of high E/N swarm experiments (Petrović et al. 1992; Petrović and Phelps 1991) which show a large degree of excitation by fast neutrals formed in charge transfer collisions with fast ions. At high E/N, which can be only achieved under breakdown conditions to the left of the Paschen minimum, the mean free paths are sufficiently high to allow large energy gain by ions. In addition it is possible to have reflection and neutralization of ions with reflection as fast neutrals, which leads to different components in blue and red wings of the Doppler profile (Petrović et al. 1992).

Some alternative explanations of anomalous Doppler profiles were offered in the literature (Mills et al. 2002), but all reliable measurements performed so far (Jovićević et al. 2004; Tatarova et al. 2007) do not require more than a combination of dissociative excitation (with a perhaps possible recombination as well playing some role) and acceleration in high fields leading to heavy particle (predominantly fast neutral) excitation.

On the other hand, high E/N swarm DC experiment (Townsend regime discharge) may be modeled directly and exactly as it does not require self consistent calculation of the electric field and is thus open to a simple Monte Carlo simulation that may include complexity at the level of representation of collisional events. In this paper we show revised results of modeling of Doppler profiles by using a well tested Monte Carlo procedure and revised models of heavy particle collisions. In particular we study the importance of fast H_2 and fast H particles, the effect of different models of angular distribution of particles scattered of the surface and of the molecules and we study the role of the energy losses due to vibrational excitation.

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Invited lecture

RECENT WORK ON LINE SHAPES FOR THE SPECTRA OF COOL STARS

G. Peach, S. J. Gibson, D. F. T. Mullamphy, V. Venturi, I. B. Whittingham

University College London, Department of Physics and Astronomy,
Gower Street,London WC1E 6BT, UK
e-mail: ucap22g@ucl.ac.uk

Accurate pressure broadened profiles of alkali resonance doublets perturbed by helium are needed for modelling of the atmospheres of late M, L and T type brown dwarfs and for generating their synthetic spectra in the region 600 - 900 nm. Previous fully quantum-mechanical calculations of the line widths and shifts are extended to consider the line-wing profiles where impact theory is no longer valid. Results will be presented at the Conference.

Invited lecture

MODELLING THE SPECTRUM OF THE STELLAR POPULATION IN STAR FORMING AND ACTIVE GALAXIES

P. Prugniel

CRAL - Observatoire de Lyon
9 Av. C. André, 69561 Saint-Genis Laval, France
e-mail: prugniel@obs.univ-lyon1.fr

Emission lines in active nuclei or star forming gaalaxies are overimposed to the absorption line spectrum of the underlying stellar population. Modelling this stellar population allows to make a proper subtraction of this component in order to analyse the emission lines, but it also give a handle on the age, metallicity and possibly history of the stellar population.

I will review the possible approach to this question and discuss the recent progress in modelling a stellar population.

Invited lecture

STARK PARAMETERS REGULARITIES OF MULTIPLY CHARGED ION SPECTRAL LINES ORIGINATING FROM THE SAME TRANSITION ARRAY

J. Purić[1], M. Šćepanović[2], I. Dojčinović[1], M. Kuraica[1], B. Obradović[1]

[1]*Faculty of Physics, University of Belgrade, P.O. Box 368, 11 000 Belgrade, Serbia*
Center for Science and Technology Development,
Obilicev venac 26, 11 000 Belgrade, Serbia
[2]*Faculty of Sciences and Mathematics, University of Montenegro,*
P.O. Box 211, 81 000 Podgorica, Montenegro

Stark widths and shift regularities of the multiply charged ions spectral lines originating from the same transition array have been studied. The emphases are on the Stark widths and shift dependences on the upper level ionization potential and the rest core charge of the emitters. Stark parameters temperature dependences have been deduced from the found regularities. The found regularities can be used for Stark widths and shifts predictions for the lines of multiply ionized spectral lines where not existed so far. The accuracy of the obtained width and shift values are of the same order as the accuracies of the used data in the procedure of finding regularities

Invited lecture

3D SPECTROSCOPY OF NUCLEAR AND EXTRANUCLEAR REGIONS OF NEARBY AGN

P. Rafanelli

Dipartimento di Astronomia, Universita di Padova,
Vicolo dell`Osservatorio 2, 35122 Padova, Italy
e-mail: piraf@pd.astro.it

3D spectroscopy, is a modern method of investigation in observational astronomy, since it provides simultaneously a spectrum, under the same atmospheric and instrumental conditions, for each spatial element of a two-dimensional field of view. This gives a clear advantage with respect to classical sequential spectroscopic techniques, as long slit scans or Fabry-Perot interferometry, when studying extended sources, like galactic and extragalactic gaseous nebulae or nearby and distant galaxies.

Therefore 3D spectroscopy is intrisecally suited for a large number of observing programs and different kinds of targets.

Among them, it is doubtless of great importance the study of Active Galactic Nuclei (AGN), and in particular of the nuclear and circumnuclear regions of nearby Seyfert

galaxies (z < 0.1). In fact, it is in this circumnuclear environment that we are likely to find the gas and dust which may serve as fuel for the active nucleus.

In close collaboration with the astronomers of the Special Astrophysical Observatory (SAO-RAS, Russia), we have carried out an observational campaign aimed to study in detail the nuclear and circumnuclear regions of about 30 nearby AGN, and therefore to strongly improve the statistical significance of the results about the features of these regions.

The analysis and interpretation of this large amount of data will have a significant impact not only on the general understanding of the AGN nature and properties, but also on the Unification Theories which justify the differences observed in Type 1 and Type 2 AGN with simple effects of orientation of AGN with respect to our line-of-sight.

Invited lecture

PULSATION TOMOGRAPHY OF ROAp STARS

M. Sachkov, T. Ryabchikova

Institute of astronomy RAS
48 Pyatnitskaya str., 119017 Moscow Russia
e-mail: msachkov@inasan.ru

We present recent results of the observational study of rapidly oscillating Ap (ROAp) stars. Spectacular progress in this field has been achieved by considering high time resolution spectroscopy in addition to the classical high-speed photometric measurements. Spectroscopic observations of roAp pulsations led to the discovery of a multitude of unexpected phenomena, generally pointing to an extreme vertical chemical nonuniformity of the atmospheres of magnetic CP stars. Detailed analysis of spectroscopic pulsational behaviour allows us to establish relashionship between pulsations and vertical stratification of chemical elements.

Invited lecture

PLASMA ANALOGUE FOR ASTROPHYSICAL DUST

I. Stefanović, E. Kovačević, J. Berndt, J. Winter

Institut für Experimentalphysik II, (Anwendungsorientierteplasmaphysik),
Ruhr-Universität Bochum, Geb. NB5/66, 44780 Bochum, Deutschland
e-mail: ilija.stefanovic@rub.de

Carbonaceous compounds are a significant component of interstellar dust and the composition and structure of such materials is therefore of key importance. We present 1.5 μm-15 μm spectra of a plasma polymerized carbonaceous material produced in RF discharge under low pressure, using C_2^{++} H_2^{++} as a precursor component. The plasma polymerization process described here provides a convenient way to make carbonaceous interstellar dust analogs under controlled conditions and to compare their characteristics to astronomical observations. Here, we focus on a comparison to the IR spectra of interstellar dust in the light of the criteria for "good" carbonaceous interstellar dust analogue. The UV bump at extinction curve 217.5 nm is another key feature for understanding the abundance of carbon in interstellar media. We present here some preliminary results of UV extinction on plasma polymerized astro-analogue.

Invited lecture

EMISSION LINES IN X-RAY SPECTRA OF CLUSTERS OF GALAXIES

P. Tozzi

INAF Osservatorio Astronomico di Trieste,
via Tiepolo 11, I-34131 Trieste, Italy
e-mail: tozzi@ts.astro.it

Clusters of galaxies are the largest virialized structures in the Universe. As a result of adiabatic compression and shocks generated by supersonic motion during virialization, a hot thin gas permeating the cluster gravitational potential well is formed. Typically this gas, which is enriched with metals ejected form Supernovae (SNe) explosions through subsequent episodes of star formation, reaches temperatures of several 10^7 K and therefore emits mainly via thermal bremsstrahlung in the X-rays. Strong emission lines may originate by collisional excitation of K- and L-shell transitions in highly ionized elements, such as H- and He-like Iron, Oxygen, Silicon or Sulfur. In the isothermal approximation, the line intensities depend on the abundances of heavy elements, while the continuum intensity is mainly due to Hydrogen and Helium.

Here we discuss the main results in the field of X-ray clusters of galaxies, based on the line diagnostics of X--ray spectra from the diffuse ICM emission. Important results have been established in the last six years thanks to the X-ray satellites Chandra and XMM, concerning both low and high redshift objects.

Invited lecture

Fe Kα LINE SIMULATIONS FOR BHs: THE SIMPLEST MODEL

A. F. Zakharov

State Scientific Center - Institute of Theoretical and Experimental Physics,
Moscow, Russia
e-mail: zakharov@itep.ru

We consider phenomena where we have to use general relativistic approaches to explain present and future observational data like Fe Kα line profiles and shapes of shadows around black holes. Different X-ray missions such as ASCA, XMM-Newton, Chandra etc. discovered features of Fe Kα lines and other X-ray lines as well. Attempts to fit spectral line shapes lead to conclusions that sometimes the profiles should correspond to radiating regions which are located in the innermost parts of accretion disks where contributions of general relativistic phenomena are extremely important. As an illustration we consider a radiating annulus model to clarify claims given recently by Müller & Camenzind (2004). We discuss properties of highly inclined disks and analyze a possibility to evaluate magnetic fields near black hole horizons.

SHORT TALKS

Short talk

THE BROAD Hα AND Hβ EMISSION LINE SHAPES IN AN AGN SAMPLE

E. Bon, L. Č. Popović, N. Gavrilović

Astronomical Observatory, Volgina 7, 11160 Belgrade, Serbia

In order to conclude about the kinematics in the Broad Line Region (BLR) we investigate broad Hα and Hβ emission line shapes in a sample of active galactic nuclei (AGN) taken from SDSS database. We measured full widths at 10%, 20% and 30% of the intensity maximum. After these widths are normalized to the full width of half maximum they are compared for the Hβ and Hα lines. We found that there is a good correlation between normalized withs at 10%, 20% and 30% in the sample for both, Hα and Hβ emission line.

This correlation cannot be explained assuming only standard line profiles (Gaussian, Lorentz and Voigt), and it represents the fact that geometry of the BLR significantly affects the line profiles in AGN.

Short talk

SHAPES OF SPECTRAL LINES OF NONUNIFORM PLASMA OF ELECTRIC ARC DISCHARGE BETWEEN COPPER ELECTRODES

V. F. Boretskij, A. N. Veklich, I. L. Babich

Taras Shevchenko Kyiv National University,
64, Volodymyrs`ka Str., Kyiv 01033, Ukraine
e-mail: boretskij@univ.kiev.ua

As well known, parameters of electric arc plasma which appear between contacts surfaces of switching devices depend from the electrode materials. The copper based composition materials (for example, Cu-W and Cu-Mo) are often used in the electrical engineering as electrode materials.

In our previous investigations of free burning in air electric arc between consumable electrodes we determined the electron density and the temperature in plasma by the optical spectroscopy. In a case of local thermodynamical equilibrium (LTE) the plasma composition can be calculated. So, obtained in such manner plasma parameters can be used for developing of the physical model of this multicomponent plasma source.

In this paper measurements were carried out in plasma of arc between Cu electrodes at current 3.5A and 30A. Discharge gap was l_{ak} = 2, 4, 6, 8 mm.

To determine the radial profile of electron density we investigated the shape of spectral line CuI 515.3 nm broadened by the dominating quadratic Stark effect. The Fabry-Perot interferometer (FPI) was used to study simultaneously the broadening of this line in the radial direction. We developed graphical program interface based on simulation which allows to provide the treatment of experimental obtained interferograms. By varying of the electron density and radial distribution of spectral line intensity it can be possible to reproduce the interferogram and to have in such manner these plasma parameters. We considered the case of axial symmetry of nonuniform plasma source distribution. To obtain the observed distribution of radiation intensity it must be integrated by full range of wavelengths which is selected by spectral device for preliminary monochromatization MDR-12. The transformation of radiation intensity by FPI is described as the function $J(\theta,\lambda)$, where θ is the angle of the incident radiation.

In addition the temperature radial profiles were calculated from relative intensities of several pairs of CuI spectral lines: 465.1, 510.5, 515.3, 521.8 and 578.2 nm, using spectroscopic data from different sources.

The electron density and the temperature in plasma as initial parameters were used in the calculation of the plasma composition in LTE assumption. We used the Saha's equation for copper, nitrogen and oxygen atoms, dissociation equation for nitrogen and oxygen atoms, the equation of plasma electrical neutrality and Dalton's law as well. So, it is possible to determine the amounts of metal vapors in plasma.

Short talk

STUDYING THE COMPLEX ABSORPTION AND EMISSION LINES IN AGN SPECTRA

E. Chatzichristou[1], E. Danezis[2], L. Č. Popović[3], E. Lyratzi[2], M. S. Dimitrijević[3]

[1]*Institute of Astronomy and Astrophysics, National Observatory of Athens Lofos Nymfon, Thiseio, P.O.Box 20048GR-11810 Athens, Greece.*
[2]*University of Athens, Faculty of Physics, Department of Astrophysics, Astronomy and Mechanics, Panepistimioupoli, Zographou 157 84, Athens – Greece*
[3]*Astronomical Observatory, Volgina 7, 11160 Belgrade, Serbia*

Some spectra of AGN present peculiar profiles that result from dynamical processes such as accretion and/or ejection of matter from these objects. In this paper we explain the idea of DACs/SACs phenomena, as a reason of spectral lines peculiarity in AGN. We present the main points of a kinematical model enabling us to study the density regions in the plasma surrounding of the studied objects, where DACs/SACs of a spectral line are created producing the observed peculiar profiles. Using this model we study a number of spectral lines in the spectra of eight AGN presenting a plain analysis of the physical parameters of the regions where these spectral lines are created. Finally, we try to present some ideas about the origin of the phenomena responsible for the observed peculiar profiles of the studied AGN spectral lines.

Short talk

STARK BROADENING OF Cr II SPECTRAL LINES IN STELLAR ATMOSPHERES

M. S. Dimitrijević[1], T. Ryabchikova[2,3], Z. Simić[1], L. Č. Popović[1], M. Dačić[1]

[1]*Astronomical Observatory, Volgina 7, 11160 Belgrade, Serbia*
[2]*Institute of Astronomy, Russian Academy of Science, Pyatnitskaya 48, 119017 Moscow, Russia*
[3]*Institute for Astronomy, University of Vienna, Türkenschanzstrasse 17, A-1180 Vienna, Austria*

Cr is one of the most peculiar elements in the atmospheres of magnetic chemically peculiar stars, where a great number of Cr I and Cr II lines in large range of excitation energies are identified. Cr II spectral lines are third on number and intensity among metals, before Fe II and Ti II in Ae/Be Herbig Star V 380 Ori. Ionized chromium lines were found for example in Alpha UMi (Polaris) and HR 7308, and in the spectrum of XX Oph 58 emission Cr II lines were observed. Consequently, data on the Stark broadening of Cr II lines are obviously of interest for the modelling and analysis of stellar spectra.

We have calculated, by using the semiclassical perturbation approach, Stark broadening parameters for Cr II spectral lines and used the obtained results to investigate the influence of Stark broadening effect in stellar atmosphere for these lines. From our investigation we can conclude that newly calculated Stark widths for a number of strong Cr II lines agree well with the scarse laboratory data and provide a good fit to the line profiles observed in Ap stars. New Stark parameters are particular important for the study of Cr stratification in Ap stars in 9000 - 10000 K temperature region, where this stratification may be obtained from the careful study of the line profiles of multiplet 3 Cr II lines only.

Short talk

SPECTROSCOPIC STUDY OF PLASMA FLOW FROM MAGNETOPLASMA COMPRESSOR OPERATED IN NITROGENE

I. Dojčinović, M. Kuraica, B. Obradović, J. Purić

Faculty of Physics, University of Belgrade, P.O. Box 368, 11 000 Belgrade, Serbia
Center for Science and Technology Development, Obilićev venac 26, 11 000 Belgrade, Serbia

Singly ionized nitrogene spectral line profiles emitted from magnetoplasma compressor operated in nitrogene, have been scanned and studied. Plasma flow velocities were determined using ultra high speed camera. The electron temperatures have been determined from the Boltzmann slope of the relative intensities of N II spectral lines. The electron densities have been determined from the Stark widths ands shifts of several scanned N II spectral lines. Using an input energy up to 5 kJ the measured plasma flow velocity, electron density and temperature were found to be up to 35 km/s, $2\cdot10^{16}$ cm^{-3} and 4 eV, respectively.

Short talk

COLLISIONAL BROADENING OF Na I IN METAL-RICH WHITE DWARFS - BEYOND THE SINGLE PERTURBER APPROXIMATION

D. Homeier[1], N. Allard[2]

[1]*Institut für Astrophysik Göttingen, Georg-August-Universität Göttingen*
Friedrich-Hund-Platz 1, 37077 Göttingen, Germany
e-mail: derek@astro.physik.uni-goettingen.de
[2]*IAP, Institut d'Astrophysique de Paris*

Ultracool stellar atmospheres show absorption by alkali resonance lines severely broadened by collisions with neutral perturbers. In the coolest and densest atmospheres, such as those of T dwarfs, Na I and K I broadened by molecular hydrogen and helium can come to dominate the entire optical spectrum, which has been successfully modelled with accurate interaction potentials in the adiabatic theory, computing line profiles from the first few orders of a density
expansion of the autocorrelation function. Observations of some white dwarfs indicate absorption due to Na I subject to even higher perturber densities than in brown dwarfs. We find that the line profile under such conditions is strongly determined by multiple-perturber interactions at short distances and can no longer be reproduced by a density expansion, but requires calculation of the full adiabatic profile. We present the first model atmosphere calculations using such profiles and compare them compare them to observed spectra of ultracool, metal-rich white dwarfs.

Short talk

PHYSICAL PROPERTIES OF THE BLR REGION: BP vs. CLOUDY CALCULATIONS

D. Ilić[1], L. Č. Popović[2], S. Ciroi[3], P. Rafanelli[3]

[1]*Department of Astronomy, Faculty of Mathematics, University of Belgrade, Serbia*
[2]*Astronomical Observatory, Volgina 7, 11160 Belgrade, Serbia*
[3]*Dipartimento di Astronomia, Universita di Padova, Italy*

In order to estimate the electron temperature of the Broad Line Region (BLR) of Active Galactic Nuclei (AGN) one can apply a simple Boltzmann-plot (BP) method to the broad Balmer lines (Popović 2003, 2006). We study here the applicability of the BP method by using the photoionization code CLOUDY. We consider different gas densities and ionizing flux values in order to obtain a situation where the population of upper levels of neutral hydrogen follows the Saha-Boltzman distribution.

Short talk

APPLICATION OF LINE PROFILE FUNCTIONS TO SYNTHETIC SPECTRA OF COOL AND HOT STELLAR OBJECTS

C. M. S. Johnas

Hamburger Sternwarte, University of Hamburg
e-mail: cjohnas@hs.uni-hamburg.de

We present a study of profile functions in various stellar objects ranging from cool dwarfs up to white dwarfs. The alkali resonance absorption lines, especially the line far wings, are dominant in the optical spectrum of cool dwarfs. NaI and KI play an extraordinary role in the formation of the spectra. We present an analysis of differently calculated alkali resonance line profile functions and their application to observations. Furthermore, we present the effect of selected Stark broadened lines for hotter and denser stellar objects. Model atmospheres are necessary in order to calculate synthetic spectra and to derive reliable parameters and surface chemical composition for such objects. For the models and the synthetic spectra we use the general purpose stellar atmosphere code PHOENIX (Hauschildt & Baron 1999).

Short talk

THE SHAPE OF THE Fe Kα SPECTRAL LINE IN THE CASE OF PARTLY OBSCURED ACCRETION DISK

P. Jovanović, L. Č. Popović

Astronomical Observatory, Volgina 7, 11160 Belgrade, Serbia
e-mail: pjovanovic@aob.bg.ac.yu, lpopovic@aob.bg.ac.yu

The X-ray emission from a relativistic accretion disk around central Black Hole (BH) of Active Galactic Nuclei (AGN) could be significantly absorbed by an outflowing wind, especially in case of so-called Low Ionization Broad Absorption Line (LoBAL) quasars. Recent observations of such quasars (e.g. Mrk 231, see Braito et al. 2004; Chartas et al. 2006) confirmed the presence of X-ray absorbers in these objects. In this paper we studied the changes of Fe Kα spectral line shape in the case when a portion of the accretion disk is blocked from our view by the X-ray absorbing/obscuring material, while the rest of the accretion disk is less absorbed/obscured and visible. To analyze the disk emission we used a ray-tracing method considering both metrics: Schwarzschild and Kerr. Obtained results show that absorbing/obscuring material can induce significant changes in the Fe Kα line shape, depending on geometry of the X-ray absorbers.

Short talk

DETAILED ANALYSIS OF BALMER LINES IN A SELECTED SAMPLE OF 90 BROAD LINE AGN

G. La Mura[1], L. Č. Popović[2], S. Ciroi[1], P. Rafanelli[1], D. Ilić[3]

[1]*Dipartimento di Astronomia, University of Padova*
Via Mohringen, 2 - 35041 Battaglia Terme (PD), Italy
e-mail: giovanni.lamura@unipd.it
[2]*Astronomical Observatory, Volgina 7, 11160 Belgrade, Serbia*
[3]*Department of Astronomy, Faculty of Mathematics,*
University of Belgrade, Serbia

To investigate the physical conditions within the Broad Line Region (BLR) of Active Galactic Nuclei (AGN) we studied the spectral properties in a sample of 90 broad line emitting sources, collected at the Sloan Digital Sky Survey (SDSS) database. Taking into account the Balmer series of hydrogen emission lines, we analyzed the broad line components, from which we extracted several flux and profile measurements. Our determinations were compared with some of the source physical properties, such as the continuum source mass, luminosity, and accretion rate, in order to test within our sample the reliability of some common assumptions and recent techniques, which are sometimes used to explore the physics of AGN.

Short talk

THE EVOLUTION OF SOME PHYSICAL PARAMETERS IN THE DACs/SACs REGIONS IN Be STELLAR ATMOSPHERES

E. Lyratzi[1], E. Danezis[1], M. S. Dimitrijević[2], L. Č. Popović[2], D. Nikolaidis[1], A. Antoniou[1]

[1]*University of Athens, Faculty of Physics, Department of Astrophysics,*
Astronomy and Mechanics, Panepistimioupoli, Zographou 157 84, Athens, Greece
[2]*Astronomical Observatory, Volgina 7, 11160 Belgrade, Serbia*

In this study we present the evolution of the kinematic parameters and the optical depth, from the photosphere to the extreme cool envelope and we compare our results with the other bibliographic results. In order to analyse the stellar spectra we use the method proposed by Danezis et al. (2003) and we conclude that the SACs/DACs phenomena are able to explain, in a unique way, the complex and peculiar observed profiles. These results arise from the study of the Mg II (λλ 2795.523, 2802.698 Å), Si IV (λλ 1393.755, 1402.77 Å), and Hα (λ 6562,817 Å) region of a great number of Be stars of all spectral subtypes and luminosity classes (64 in the case of Mg II resonance lines and 70 in the case of Si IV resonance limes). For the study of the regions which create the complex Hα line profiles we analyzed the OHP (Observatory of Haute Provence) spectrographs of 120 Be stars of all spectral subtypes and luminosity classes.

Short talk

COWAN CODE AND STARK BROADENING OF SPECTRAL LINES OF S II, S III AND S IV

N. Milovanović, M. S. Dimitrijević

Astronomical Observatory, Volgina 7, 11060 Belgrade, Serbia
e-mail: nmilovanovic@aob.bg.ac.yu, mdimitirjevic@aob.bg.ac.yu

We present Stark broadening parameters (widths) of 5 multiplets of S II, 3 of S III and 4 of S IV calculated by using the modified semi-empirical approach (MSE). Needed atomic data (energy levels) have been calculated ab initio, using the Cowan code. Comparison of obtained for S II and S III, and taken from NIST atomic spectra database energy levels is given. We also present comparison of FWHM Stark widths calculated by using MSE and experimental widths.

Short talk

CORRELATION LINE-OF-SIGHT VELOCITY-METALLICITY IN A SAMPLE OF STARS WITH POSSIBLE PLANETARY SYSTEMS

S. Ninković[1], S. Vidojević[2]

[1]*Astronomical Observatory, Volgina 7, 11160 Belgrade, Serbia*
[2]*Astronomy Department, Faculty of Mathematics, Studentski trg 16, 11000 Beograd*
sonja@alas.matf.bg.ac.yu

We examine the line-of-sight-velocity and matallicity data in a sample of 1039 stars from the solar neighbourhood which may have planetary systems like our own. A correlation between line-of-sight velocity and metallicity is found.

Short talk

STARK PARAMETERS REGULARITIES WITHIN SPECTRAL SERIES OF DIFFERENT ATOMS AND IONS

J. Purić[1], M. Šćepanović[2], I. Dojčinović[1], M. Kuraica[1], B. Obradović[1]

[1]*Faculty of Physics, University of Belgrade, P.O. Box 368, 11 000 Belgrade, Serbia*
Center for Science and Technology Development,
Obilicev venac 26, 11 000 Belgrade, Serbia
[2]*Faculty of Sciences and Mathematics, University of Montenegro,*
P.O. Box 211, 81 000 Podgorica, Montenegro

Stark widths and shifts regularities for the spectral lines originating from the same spectral series for different atoms and ions have been found and discussed. The emphases are on the Stark parameters dependence on the upper level ionization potential. The found dependence can be used for prediction of these parameters for the members of the series not calculated or measured so far. The accuracy of the obtained widths and shift values are of the same order as the accuracies of the used data in the procedure of finding regularities.

Short talk

THE MODELING OF THE CONTINUOUS EMISSION SPECTRUM OF A DENSE NON-IDEAL PLASMA IN OPTICAL REGION

N. M. Sakan, A. A. Mihajlov, Lj. M. Ignjatović, V. A. Srećković

Institute of physics, Pregrevica 118, Zemun, Belgrade, Serbia
e-mail: vlada@phy.bg.ac.yu

The comparison of a existing data on dense hydrogen plasma with two different Coulomb cut-off modeling potentials are presented. The additional plasma phenomena, that are not primarily included in this model figure, are introduced in several different ways.

Short talk

SPECTRAL LINES IN THE AFTERGLOW OF GAMMA RAY BURSTS

S. Simić[1], L. Č. Popović[2]

[1]*Faculty of Science, Department of Physics,*
Radoja Domanovića 12, 34000 Kragujevac
[2] *Astronomical Observatory, Volgina 7, 11160 Belgrade, Serbia*
e-mail: ssimic@kg.ac.yu

In this short talk we will give a brief description of the observed spectral lines in the afterglow of the gamma ray bursts (GRB). The nature of the GRB afterglow is based on the fast moving matter entering the surrounding steady interstellar medium. As the result of the interaction absorption and emission lines could be produced. We will present a simplified analyze using known line profiles to show a possible way of lines creation. Also, we will discuss the influence of different GRB models which describe the fireball evolution on line profiles observed in an afterglow.

Short talk

Mrk 334: CONNECTION BETWEEN NUCLEI ACTIVITY AND MERGING OF A COMPANION

A. A. Smirnova, A.V. Moiseev, V. L. Afanasiev

Special Astrophysical Observatory of RAS,
Nizhnij Arkhyz, Zelenchukskaya, Karachaevo-Cherkesia, Russia 369167
e-mail: alexiya@sao.ru

We have investigated Mrk 334 using method of panoramic spectroscopy on Russian 6m telescope. The central regions were observed with integral-field spectrograph MPFS, the large-scale velocity fields of the ionized gas in the emission lines were constructed from observations with scanning Fabry-Perot interferometer. Based on these data we consider gas and star kinematic in the circumnuclear region as well as in the outer parts of the galaxy. The effects of possible merging on the AGN fuelling are studied.

POSTERS

Poster paper

A STATISTICAL STUDY OF PHYSICAL PARAMETERS OF THE C IV DENSITY REGIONS IN 20 Oe STARS

A. Antoniou[1], E. Danezis[1], E. Lyratzi[1], D. Nikolaidis[1], L. Č. Popović[2], M. S. Dimitrijević[2]

[1]*University of Athens, Faculty of Physics, Department of Astrophysics, Astronomy and Mechanics, Panepistimioupoli, Zographou 157 84, Athens, Greece*
[2]*Astronomical Observatory, Volgina 7, 11160 Belgrade, Serbia*

In this poster paper we detect the presence of Satellite Absorption Components (SACs) which accompany the C IV resonance lines in the spectra of 20 Oe stars of different spectral subtypes, taken with I.U.E. The existence of SACs results to the peculiar profiles of the C IV lines. Using the method proposed by Danezis et al. (2003, 2005) we found that the C IV resonance lines consist of one to five SACs. We calculate the values of the apparent rotational and radial velocities, the Gaussian standard deviation of the random motions of the ions, the random velocities of these motions, as well as the optical depth, the column density, the Full Width at Half Maximum (FWHM), the absorbed and the emitted energy of the independent regions of matter which produce the main and the satellite components of the studied spectral lines. We present the variations of these physical parameters as a function of the spectral subtype. We point out that the new and important aspect of our study is the calculation of the above parameters and their variations as a function of spectral subtype, using the DACs/SACs theory. This study represents the second part of the analysis of the C IV density regions' physical parameters in 20 Oe stars.

Poster paper

INVESTIGATION OF THE POST CORONAL DENSITY REGIONS OF Oe STARS, THROUGH THE N V UV RESONANCE LINES

A. Antoniou[1], E. Danezis[1], E. Lyratzi[1], D. Nikolaidis[1], L. Č. Popović[2], M. S. Dimitrijević[2]

[1]*University of Athens, Faculty of Physics, Department of Astrophysics, Astronomy and Mechanics, Panepistimioupoli, Zographou 157 84, Athens – Greece*
[2]*Astronomical Observatory, Volgina 7, 11160 Belgrade, Serbia*

The presence of Satellite Absorption Components (SACs) in the N V resonance lines of 20 Oe stars of different spectral subtypes is considered. Using the method proposed by Danezis et al. (2003) on the spectra of 20 Oe stars, taken with I.U.E., we detect that the C IV resonance lines consist of one to four Satellite Absorption Components (SACs). With the above method we calculate the values of the apparent rotational and radial velocities, the Gaussian standard deviation of the random motions of the ions, the random velocities of these motions, as well as the optical depth, the column density, the Full Width at Half Maximum (FWHM), the absorbed and the emitted energy of the independent regions of matter which produce the main and the satellite components of the studied spectral lines. We examine also the variations of these physical parameters as a function of the spectral subtype. We point out that the values' calculation of the above parameters and their variations as a function of spectral subtype, has been performed by using the DACs or SACs theory.

Poster paper

LONG TERM VARIABILITY OF THE CORONAL AND POST-CORONAL REGIONS OF THE Oe STAR HD 149757 (zeta Oph)

A. Antoniou[1], E. Danezis[1], E. Lyratzi[1], D. Nikolaidis[1], L. Č. Popović[2], M. S. Dimitrijević[2]

[1]*University of Athens, Faculty of Physics, Department of Astrophysics, Astronomy and Mechanics, Panepistimioupoli, Zographou 157 84, Athens – Greece*
[2]*Astronomical Observatory, Volgina 7, 11160 Belgrade, Serbia*

In the spectra of many Oe and Be stars, many spectral lines present peculiar and complex profiles due to the fact that the observed absorption features are composed of two or more absorption components (Discrete or Satellite Absorption Components - DACs/SACs). In this poster paper we detect the presence of the SACs phenomenon in the C IV, N IV and N V spectral lines in 11 spectra of the Oe star HD 149757 (zeta Oph), taken with I.U.E. during a period of 13 years. In these 11 spectra, we study the time scale variation of the apparent rotational and radial velocities, the Gaussian standard deviation of the random motions of the ions, the random velocities of these motions, as well as the optical depth, the column density, the Full Width at Half Maximum (FWHM), the absorbed and the emitted energy of the independent regions of matter which produce the main and the satellite components of the studied spectral lines. We conclude that the above spectral lines consist of one or more Satellite Absorption Components (SACs) and we examine the timescale variations of the physical parameters. An interesting phenomenon which we found is the low radial velocities (about -50 km/s) in the N IV region, while in the C IV and N V region we found higher radial velocities with values about -800 km/s and -1300 km/s respectively. We point out that the new and important aspect of our study is the calculation of the above parameters and their time scale variations, using the DACs/SACs theory.

Poster paper

THE N IV DENSITY REGIONS IN THE SPECTRA OF 20 Oe STARS

A. Antoniou[1], E. Danezis[1], E. Lyratzi[1], D. Nikolaidis[1], L. Č. Popović[2], M. S. Dimitrijević[2]

[1]*University of Athens, Faculty of Physics, Department of Astrophysics, Astronomy and Mechanics, Panepistimioupoli, Zographou 157 84, Athens – Greece*
[2]*Astronomical Observatory, Volgina 7, 11160 Belgrade, Serbia*

Here we analyze the presence of Satellite Absorption Components (SACs) in the N IV spectral lines of 20 Oe stars of different spectral subtypes and we study the physical parameters which characterize the N IV density regions in the atmospheres of 20 Oe stars. We apply the method proposed by Danezis et al. (2003, 2005) on the spectra of 20 Oe stars, taken with I.U.E. We found that the N IV spectral line consists of one or two Satellite Absorption Components. We calculate the values of the apparent rotational and radial velocities, the Gaussian standard deviation of the random motions of the ions, the random velocities of these motions, as well as the optical depth, the column density, the Full Width at Half Maximum (FWHM), the absorbed and the emitted energy of the independent regions of matter which produce the main and the satellites components of the studied spectral lines. Finally, we present the variations of these physical parameters as a function of the spectral subtype.

Poster paper

RADIAL DEPENDENCE OF EXTINCTION IN PARENT GALAXIES OF SUPERNOVAE

B. Arbutina

Astronomical Observatory, Volgina 7, 11160 Belgrade, Serbia

The problem of extinction is the most important issue to be dealt with, in the process of obtaining true absolute magnitudes of core-collapse supernovae (SNe). The plane-parallel model which gives absorption dependent on galaxy inclination, widely used in the past, was shown not to describe extinction adequately. We try to apply an alternative model which introduces radial dependence of extinction. A certain trend of dimmer SNe with decreasing radius from the center of a galaxy was found, for a chosen sample of stripped-envelope SNe.

Poster paper

A SIMPLE MONTE-CARLO SIMULATION OF EXCESSIVE DOPPLER BROADENING OF THE Hα LINE

N. Cvetanović[1], B. M. Obradović[2], M. M. Kuraica[2]

[1]*Faculty of Trans. and Traff. Engineering,*
University of Belgrade, V. Stepe 305, Belgrade,Serbia
e-mail: nikola@ff.bg.ac.yu
[2]*Faculty of Physics, University of Belgrade, Studentski trg 12 - 16*

Excessive Doppler broadening of Hydrogen lines has been recorded in various types of discharges during the last two decades. It is also common in plasma fusion experiments. This paper deals with an explanation for origin of this effect using the collision model (CM). For this purpose a computer code is developed using the Monte-Carlo technique for fast neutrals. Preliminary results are compared with earlier experimentally obtained profiles in an abnormal glow discharge.

Poster paper

QUANTUM-MECHANICAL CALCULATIONS OF Ne VII SPECTRAL LINE WIDTHS

H. Elabidi[1], N. Ben Nessib[2], M. Cornille[3], J. Dubau[3,4], S. Sahal-Bréchot[5]

[1]*Groupe de recherche en Physique Atomique et Astrophysique, Faculté des Sciences de Bizerte, 7021 Zarzouna, Bizerte, Tunisia*
[2]*Groupe de recherche en Physique Atomique et Astrophysique, Institut National des Sciences Appliquées et de Technologie, Centre Urbain Nord, B.P. 676, 1080 Tunis Cedex, Tunisia*
[3]*LUTH, UMR 8102 CNRS, Observatoire de Paris-Meudon, F-92195 Meudon Cedex, France*
[4]*LIXAM, UMR 8624 CNRS, Université Paris-Sud, F-91405 Orsay Cedex, France*
[5]*LERMA, UMR 8112 CNRS, Observatoire de Paris-Meudon, F-92195 Meudon Cedex, France*

Diagnostic of stellar and laboratory plasmas, atomic abundances, opacity calculations, particles densities can be determined through knowledge of Stark broadening of isolated spectral lines of multicharged ions in plasmas.

Several methods and techniques were used for the evaluation of broadening parameters, we can cote semi-classical (Griem 1974, 1997, Sahal-Bréchot 1969), modified (Dimitrijević and Konjević 1980), semi-empirical (Griem 1968) and quantum-mechanical calculations (Baranger 1958, Seaton 1988, Griem et al.1997, Ralchenko et al., 1999, 2001, 2003). The two first methods showed a good accuracy for neutral elements and low-charge ions. But, most of the quantum-mechanical calculations are still very limited and they showed that they underestimate the majority of experimental widths and they have the greatest difference from the experimental results compared to the other theoretical calculations. Consequently, new accurate calculations and a detail comparison with experiments become an important and an urgent task.

In this work, we apply our quantum-mechanical expression (Elabidi et al. 2004) to the calculations of electron impact Stark widths of the Ne VII 2s3s-2s3p transitions. Calculations are made in the frame of the impact approximation and for intermediate coupling, taking into account fine structure effects. A comparison between our calculations and experimental and other theoretical results showed a good agreement. This is the first time that we find such a good agreement between quantum and experimental line widths of highly charged ions.

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Poster paper

CONNECTION BETWEEN CENTRAL BLACK HOLE AND CIRCUM-NUCLEAR GAS KINEMATICS: THE CASE OF AGN WITH DOUBLE-PEAKED LINES

N. Gavrilović[1], E. Bon[1], L. Č. Popović[1], P. Prugniel[2]

[1]*Astronomical Observatory, Volgina 7, 11160 Belgrade, Serbia*
[2]*CRAL - Observatoire de Lyon, France*

Less than 5 percents of active galaxies have optical double-peaked broad lines which indicate presence of an accretion disk in the Broad Line Region (BLR). Using these lines, it is possible to determine accretion disk parameters (inner and outer radius, inclination). Here we will present an analysis of accretion disc parameters obtained from a sample Active Galactic Nuclei (AGN) with double peaked lines from SDSS.
These parameters will be compared with the circum-nuclear gas kinematics in order to make systematic analyze of mass transfer mechanism from galactic scales, down to nuclear scales, and feedback of activity on a process of star formation in the circum-nuclear region.

Poster paper

ATOMIC DATA AND STARK BROADENING PARAMETERS FOR Si VI ION

R. Hamdi[1], N. Ben Nessib[1], M.S. Dimitrijević[2,3], S. Sahal-Bréchot[4]

[1] *Groupe de Recherche en Physique Atomique et Astrophysique,*
Institut National des Sciences Appliquées et de Technologie, Centre Urbain Nord,
B. P. No. 676, 1080 Tunis Cedex, Tunisia
[2] *Astronomical observatory, Volgina 7, 11160 Belgrade 74, Serbia*
[3] *Isaac Newton Institut of Chilie, Yugoslavia Branch*
[4] *Laboratoire d'Etude du Rayonnement et de la Matière en Astrophysique,*
UMR CNRS 8112, Observatoire de Paris-Meudon, 92195 Meudon, France

Energy levels, electric dipole transition probabilities and oscillator strength for five times ionized silicon have been calculated in intermediate coupling. The present calculations were carried out with the general purpose atomic-structure program SUPERSTRUCTURE. The relativistic corrections to the non-relativistic Hamiltonian are taken into account through the Breit-Pauli approximation. We have also introduced a semi-empirical correction (TEC) for the calculation of the energy-levels. These atomic data are used to provide semiclassical electron-, proton- and ionized helium- impact line widths and shifts for 15 Si VI muliplet.

Stark broadening widths and shifts are calculated for a perturber density of 10^{17} cm^{-3} and for temperatures from 50000 to 800000 K. Such temperatures are of interest for the modelling and analysis of x-ray spectra, such as the spectra obtained by Chandra, modelling of some hot star atmospheres (e.g. PG 1195), subphotospheric layres, soft x-ray lasers and laser produced plasmas. Higher temperatures are of interest for fusion plasma as well as for stellar interiors.

Poster paper

OPTICAL SEARCH FOR SUPERNOVA REMNANTS IN M81 AND M82

D. Ilić[1], B. Arbutina[2], D. Urošević[1], B. Vukotić[1], K. Stavrev[3]

[1]*Astronomy Department, Faculty of Mathematics, Studentski trg 16, 11000 Beograd*
[2]*Astronomical Observatory, Volgina 7, 11160 Belgrade, Serbia*
[3]*Institute of Astronomy, Bulgarian Academy of Sciences,*
72 Tsarigradsko Shosse Blvd., BG-1784 Sofia, Bulgaria

M81 and M82 form a most conspicuous physical pair among the nearby galaxies. M82 is a starburst galaxy – it's sturburst activity is most likely a result of the encounter with M81. As a consequence of the enhanced star formation there is a number of compact radio supernova remnant (SNR) candidates discovered in M82, and some preliminary results indicate the existence of a number of optical candidates in M81. Our aim was to conduct an optical search at NAO Rozhen, Bulgaria, in the narrow [S II] and Hα filters to confirm the SNR status of the existing objects and possibly do discover new SNR candidates.

Poster paper

LAG BETWEEN THE OPTICAL CONTINUUM AND LINE VARIABILITIES OF NGC 4151

A. Kovačević[1], A. I. Shapovalova[2], L. Č. Popović[3], N. G. Bochkarev[4], A. N. Burenkov[2], V. H. Chavushyan[5]

[1]*Astronomy Department, Faculty of Mathematics, Studentski trg 16, 11000 Beograd*
[2]*Special Astrophysical Observatory of the Russian AS, Nizhnij Arkhyz, Karachaevo-Cherkesia 369167, Russia*
[3]*Astronomical Observatory, Volgina 7, 11160 Belgrade, Serbia*
[4]*Sternberg Astronomical Institute, Moscow, Russia*
[5]*Observatorio Astronomico Nacional, Instituto de Astronomía, Universidad Nacional Autónoma de México, 22860 Ensenada, BC, México*

Using a long term spectroscopic observation of NGC 4151 (1996 to 2006) we used z-transfomed discrete correlation function (ZDCF) function to find the lag time between the broad lines (He II, Hγ, Hβ and Hα) and the optical continuum. Also, we discuss how the wings and core variation respons to the optical continuum one.

Poster paper

ASYMMETRY OF THE C IV 1549 LINE IN A SAMPLE OF RQ AND RL AGN

J. Kovačević[1], R. Bachev[2], L. Č. Popović[1], P. Marziani[2], R. Zamanov[3]

[1]*Astronomical Observatory, Volgina 7, 11160 Belgrade, Serbia*
[2] *Institute of Astronomy, Sofia 1784, Bulgaria*
[3]*Osservatorio astronomico di Padova, Instituto Nazionale di Astrofisica, Vicolo dell'Osservatorio 5, 1-35122 Padova, Italy*

Here we investigate the asymmetry of the CIV line in a sample of RQ and RL AGN in order to find signature of an outflow in CIV emission region. We apply multi-component Gaussian analysis to fit the lines. We consider the parameters of the components (emission and absorption), separatly in Radio Loud (RL) and Radio Quiet (RQ) AGN.

Poster paper

CALCULATION OF THE MULTIPLET FACTOR $l_1^n(L_nS_n)\ l_2^m(L_mS_m)\ l_3^p(L_pS_p)$ IN LS-COUPLING

W. Mahmoudi[1], N. Ben Nessib[2], S. Sahal-Bréchot[3]

[1]*Groupe deRecherche en Physique Atomique et Astrophysique,*
Faculté des Sciences de Bizerte, 7021 Zarzouna, Bizerte, Tunisia
[2]*Groupe de Recherche en Physique Atomique et Astrophysique,*
Institut National des Sciences Appliquées et de Technologie, Centre Urbain Nord,
B.P. 676 Tunis Cedex, Tunisia
[3]*LERMA, Observatoire de Paris, Section de Meudon,*
UMR CNRS 8112, Batiment 18, 5 Place Jules Janssen,
F-2195, Meudon Cedex, France

Sahal-Bréchot (1974) studied the Stark broadening of isolated lines in the impact approximation; semi-classical formulae were provided, including both dipole and quadrupole in the expansion of the electrostatic interaction between the optical electron and the perturber. Therefore the angular factors of the quadrupole term appearing in the semi-classical expression of the width of line broadened by electron or ion impact is calculated in L-S coupling for complex atoms, using the Fano-Racah algebra.

She studied the multiplet factor for a configuration of the type ln and $l_1^n(L_nS_n)\ l_2^m(L_mS_m)$. Therefore angular factors B_i, B_f and B_{if} need a generalization for more complicated configurations.

Here we present a formula for the multiplet factor for configuration of the type $l_1^n(L_nS_n)\ l_2^m(L_mS_m)\ l_3^p(L_pS_p)$ in L-S coupling.

R_{mult} has the usual meaning (Shore and Menzel 1968; Dekker 1969), noting that we are here interested in the diagonal elements for calculating angular factors.

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Poster paper

EXPERIMENTAL AND THEORETICAL STARK WIDTHS FOR Au II

R. Mayo[1], M. Ortiz[2], M. S. Dimitrijević[3], Z. Simić[3]

[1]*Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (CIEMAT), Avda. Complutense, 22, 28040 Madrid, Spain*
[2]*Dpto. de Física Atómica, Molecular y Nuclear, Facultad de Ciencias Físicas, Universidad Complutense de Madrid (UCM), 28040 Madrid, Spain*
[3]*Astronomical Observatory, Volgina 7, 11160 Belgrade, Serbia*

In the present work, we have studied experimentally and theoretically the Stark widths from several lines of Au II, and, some of them not measured before. The interest in Au II resides not only on the knowledge of its atomic structure to check the adequacy of theoretical models, but also on its astrophysical importance because it contributes to the opacity in spectra of chemically peculiar stars (Leckrone et al. 1993).

The plasma source of Au II spectrum was produced by laser ablation on pure gold. Due to the effects of self-absorption, some isolated lines were ruled out. The neutral atom and other higher ions from gold were present in the plasma. The experimental work was performed in the facility provided by UCM and employed the Laser Induced Breakdown Spectroscopy (LIBS) technique. A Nd:YAG laser beam focused on the surface of the target was used to generate the plasma in a controlled argon atmosphere. The light emitted by the laser-produced plasma was focused on the input slit of a grating monochromator (1-m Czerny-Turner, 16pm resolution in second order), which was coupled with a time-resolved optical multichannel analyzer system (OMA III, EG&G). The experimental plasma conditions were obtained from a Boltzmann plot of the temperature and by means of the Saha equation. Experimental branching ratios and already published data for transition probabilities were used for this purpose.

The theoretical results were obtained using the semiclassical perturbation approach (Sahal-Bréchot 1969ab) and the modified semiempirical approach (Dimitrijević and Konjević 1980). Obtained experimental and theoretical results were compared and discussed.

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Poster paper

STUDYING OF SOME CANDIDATES TO POLAR-RING GALAXIES BY THE METHODS OF 2D-SPECTROSCOPY

O. Merkulova

Saint-Petersburg State University
Russia, St.Petersburg, Universitetskiy pr., 28
olga_merkulova@list.ru

Polar-ring galaxies (PRG) are the rare class of dynamically peculiar systems in which the ring of stars, gas and dust rotates around the main body approximately in polar plane. Here the results of the spectral study of some galaxies - candidates to PRG - are presented. The large-scale velocity fields and intensity maps of the ionized gas were constructed from observations with scanning interferometer Fabry-Perot at the 6-m telescope of the Special Astrophysical Observatory (Russia). Also the long-slit spectra were obtained to get the information about stellar kinematics from the absorption lines. The analysis of the data on morphology and kinematics of the gaseous and stellar subsystems was carried out. The shape of emission lines allowed us to reveal the existence of multicomponent gas.

Poster paper

THE INFLUENCE OF ION-ATOM AND ATOM-RYDBERG ATOM PROCESSES TO THE CONTINUOUS AND LINE SPECTRA OF STELLAR ATMOSPHERES

A. Mihajlov[1], D. Jevremović[2], P. Hauschildt[3], M. S. Dimitrijević[2], Lj. M. Ignjatović[1]

[1]*Institute of Physics, P. O. Box 57, 11001 Belgrade, Serbia*
[2]*Astronomical Observatory, Volgina 7, 11060 Belgrade, Serbia*
[3]*Hamburger Sternwarte, Universitaet Hamburg, Gojenbergsweg 112, 21029 Hamburg, Germany*

In several papers was demonstrated the influence of a group of collisional chemi-ionization and chemi-recombination processes on the excited atom populations in hydrogen and helium plasmas with the ionization degree less than 10^{-3}. We have in view here the ionization processes $A^*(n) + A \rightarrow e + \{A^+ + A\}$; $A^*(n) + A \rightarrow e + A_2^+$ and the corresponding inverse recombination processes $e + A^+ + A \rightarrow A^*(n) + A$; $e + A_2^+ \rightarrow A^*(n) + A$, where A = H(1s) or He($1s^2$), $A^+ = H^+$ or $He^+(1s)$, $A^*(n) = H^*(n)$ with n larger or equal to 4, or $He^*(n)$ with n larger or equal 3, A_2^+ - molecular ion in the ground electronic state, and e – free electron.

The obtained results were than used for the investigation of the importance of these processes, for A = H in Solar atmosphere and for A = He in atmospheres of some DB white dwarfs. It was shown that these processes could not be taken into account as *a posteriori* corrections of results obtained with the standard models of atmospheres, but should be included *ab initio* in the modelisation. For such a purpose the most adequate is the computer code for the stellar atmospheres modelling PHOENIX where the computations are performed just *ab initio*. The influence of the considered processes on the structure of the stellar atmosphere model was investigated with the help of PHOENIX code on the example of the M red dwarf atmosphere, with $T_{eff} = 3800$ K. It was shown that that their inclusion changes considerably the $H^*(n)$ atom population distribution up to n = 20, without any tendence of decrease of this influence with the increase of n. This last result suggested that the considered atomic processes should influence directly and indirectly on the spectral line shapes.

We review here obtained results and present an ab initio synthesis of several hydrogen spectral lines, performed with the PHOENIX for a K type stellar atmosphere with $T_{eff} = 3300$ K.

Poster paper

GAS TEMPERATURE MEASUREMENT IN OXYGEN-NITROGEN PLASMAS DILUTED BY HYDROGEN

V. Milosavljević, D. Popović, A. R. Ellingboe, S. Daniels

Faculty of Physics, Belgrade, Serbia
e-mail: dusan@ff.bg.ac.yu

The gas temperature is measured in a DC discharge by analizing the optical emission spectrum of the second-positive band of a nitrogen molecule. Rotational temperature has been used widely as neutral gas temperature measurement in different types of plasmas. The neutral gas rotational temperature have been measured for various ratios of O_2 and N_2 in O_2 - N_2 plasmas, as well as under dilution by Hydrogen (up to 5% in the total pressure). The gas temperatures were determined by recording N_2 ($C^3\pi_u \rightarrow B^3\pi_g$) emission in the ultraviolet (337.13 nm). The working pressure was from 50 to 2000 mTorr and the DC voltage was changed from 0.8 to 2.2 kV. The technique described in this article enables the measurement of the neutral gas temperature in the discharge that is not accessible via conventional methodology using thermocouples. The results show that for some specific ratios of O_2, N_2 and H_2 the neutral gas temperature via N_2 emission is difficult to determine.

Poster paper

ELECTRIC FIELD MEASUREMENTS IN DIELECTRIC BARRIER DISCHARGE OPERATED IN NITROGEN

B. M. Obradović, I. P. Dojčinović, M. M. Kuraica, J. Purić

Faculty of Physics University of Belgrade
Studentski trg 12 - 16
e-mail: obrat@ff.bg.ac.yu

Temporary resolved spectral band intensity distributions were measured in dielectric barrier discharge operated in nitrogen. Reduced electric field strength (E/N) were estimated from the bands intensity ratio of the first negative (λ = 391.4 nm) and the second positive system (λ = 394.3 nm) of molecular nitrogen for 200 mbar and 800mbar pressure. From electrical measurements using Lissajoues figures at various pressures values of electrical power deposited in the discharge were calculated.

Poster paper

STELLAR SPECTROSCOPY ON THE NEW ASTRONOMICAL STATION AT THE MOUNTAIN VIDOJEVICA

N. Pejović, Ž. Mijajlović

Department of Astronomy, Faculty of Mathematics, University of Belgrade, Serbia

It is expected that during the year 2007 will be finished the new astronomical station, ASV, at the mountain Vidojevica near the town of Prokuplje. A part of the research at the ASV will be dedicated to the stellar spectroscopy. The Astronomical Observatory provided a spectrograph for this purpose. The aim of this paper is to discuss various possibilities in this kind of research at the ASV.

Poster paper

AN ANALYSIS OF LOCAL MILKY-WAY KINEMATICS BASED ON PROPER-MOTION AND LINE-OF-SIGHT-VELOCITY DATA

S. Vidojević

Astronomy Department, Faculty of Mathematics
Studentski trg 16, 11000 Beograd
e-mail: sonja@alas.matf.bg.ac.yu

The space heliocentric velocities are calculated for a number of nearby stars using their parallaxes and proper motions from the Hipparcos Catalogue and also their line-of-sight velocities. The distribution of these space velocities is studied in order to establish which stars belong to the thin disc, thick disc and the halo.

Poster paper

DETERMINATION OF THE GAS TEMPERATURE OF AN ARGON MICROWAVE PLASMA AT ATMOSPHERIC PRESSURE USING VAN DER WAALS BROADENING

C. Yubero[1], M. S. Dimitrijević[2], M. C. García[1], M. D. Calzada[1]

[1]*Grupo de Espectroscopia de Plasmas. Edificio A. Einstein (C-2), Campus de Rabanales. Universidad de Córdoba, 14071 Córdoba, Spain*
[2]*Astronomical Observatory, Volgina 7, 11160 Belgrade, Serbia*

The ro-vibrational emission spectra of the molecular species are usually used to measure the gas temperature of a discharge at atmospheric pressure. But, under some experimental conditions, it is difficult to detect them. In order to overcome this difficulty, and obtain the temperature, a new method based on the relation between the gas temperature and the van der Waals broadening of argon atomic spectral lines is proposed in this work.

In order to analyze the possibility to use the van der Waals broadening of the neutral-argon lines to determine the gas temperature in an argon surface-wave sustained discharge (SWD) at atmospheric pressure, the values of the gas temperature inferred from the atomic lines with that ones obtained from the analysis of the OH molecular specie spectrum, were compared. The plasma column was created in a quartz tube with one of its ends opened to the air.

Under our experimental conditions, the Lorentzian broadening is due to the Stark and the van der Waals broadenings. Considering that the Satrk broadening can be approximated to a Lorentzian function, the total Lorentzian width of a spectral line is the sum of Stark and van der Waals widths. Moreover, in an argon surface-wave plasma at atmospheric pressure the axial profile of T_g can be considered constant and so, the van der Waals broadening too. If the Lorentzian broadening of a spectral line depends on axial position, this line is sensitive to the electron density variation. This is in particular the case for the 522.1, 549.6 and 603.2 nm lines. For this reason, these lines could be used to measure the electron density in discharges at atmospheric pressure. For these spectral lines a linear fit is obtained, which intersects the ordinate at a point corresponding to the Lorentzian width for zero electron density. This value is called here an origin ordinate and is determined for each analyzed line. It can be considered approximately equal to the van der Waals width and is used here to calculate the plasma gas temperature.

From our results and the comparison with other authors we can conclude that the method, proposed in this work, gives a possibility to estimate the gas temperature from the van der Waals of atomic lines.

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LIST OF PARTICIPANTS

Bojan Arbutina
Astronomical Observatory Belgrade
Volgina 7, Belgrade, Serbia
barbutina@aob.bg.ac.yu

France Allard
Centre de Recherche Astrophysique de Lyon
École Normale Supérieure de Lyon, 46 Allée d'Italie, F-69364 Lyon, France
fallard@ens-lyon.fr

Paul Barklem
Uppsala University
Box 515, S75120 Uppsala, Sweden
barklem@astro.uu.se

Nebil Ben Nessib
Groupe de Recherche en Physique Atomique et Astrophysique,
Institut National des Sciences Appliquées et de Technologie, Centre Urbain Nord, B.P. 676 Tunis Cedex, Tunisia
nebil.bennessib@planet.tn

Edi Bon
Astronomical Observatory Belgrade
Volgina 7, Belgrade, Serbia
ebon@aob.bg.ac.yu

Viacheslav F. Boretskij
Radiophysics Dept. Taras Schevchenko Kyiv National University
64, Volodymyrs'ka str. Kyiv 01033 Ukraine
boretskij@univ.kiev.ua

George Chartas
Penn State University
525 Davey Lab, University Park, PA 16802
chartas@astro.psu.edu

Eleni Chatzichristou
Institute of Astronomy and Astrophysics, National Observatory of Athens
Lofos Nymfon, Thiseio, P.O.Box 20048GR-11810 Athens, Greece
echatz@astro.noa.gr

Magdalena Christova
Technical University-Sofia
1000 Sofia, Bulgaria
mchristo@tu-sofia.bg

Nikola Cvetanović
Faculty of Trans. and Traff. Engineering, University of Belgrade
V. Stepe 305, Belgrade,Serbia
nikola@ff.bg.ac.yu

Miodrag Dačić
Astronomical Observatory Belgrade
Volgina 7, Belgrade, Serbia
mdacic@aob.bg.ac.yu

Emmanouel Danezis
University of Athens, Faculty of Physics, Department of Astrophysics, Astronomy and Mechanics
Panepistimiopolis, Zografos 157 84, Athens - Greece
edanezis@phys.uoa.gr

John Danziger
INAF/OAT and Dept.of Astronomy,
University of Trieste, Italy
danziger@oats.inaf.it

Milan S. Dimitrijević
Astronomical Observatory Belgrade
Volgina 7, Belgrade, Serbia
mdimitrijevic@aob.bg.ac.yu

Ivan Dojčinović
Faculty of Physics, University of Belgrade
P.O. Box 368, 11 000 Belgrade, Serbia

Nataša Gavrilović
Astronomical Observatory Belgrade
Volgina 7, Belgrade, Serbia
ngavrilovic@aob.bg.ac.yu

Rafik Teufi Hamdi
Faculté des Sciences de Bizerte, 7021 Zarzouna, Bizerte, Tunisia
hamdi_rafik12003@yahoo.fr

Derek Homeier
Institut für Astrophysik Göttingen,
Georg-August-Universität Göttingen
Friedrich-Hund-Platz 1, 37077
Göttingen, Germany
derek@astro.physik.uni-goettingen.de

Dragana Ilić
Department of Astronomy, Faculty of Mathematics, University of Belgrade
Studentski trg 16, Belgrade, Serbia
dilic@matf.bg.ac.yu

Željko Ivezić
University of Washington
Dept. of Astronomy, Box 351580,
Seattle, WA 98195, USA
ivezic@astro.washington.edu

Darko Jevremović
Astronomical Observatory Belgrade
Volgina 7, Belgrade, Serbia
djc@nhn.ou.edu, darko@aob.bg.ac.yu

Christine Johnas
Hamburger Sternwarte, Gojenbergsweg 112, D-21029 Hamburg
cjohnas@hs.uni-hamburg.de

Predrag Jovanović
Astronomical Observatory Belgrade
Volgina 7, Belgrade, Serbia
pjovanovic@aob.bg.ac.yu

Andrei N. Klyucharev
St Petersburg State University / Research Institute of Physics
1, Ulyanovskaya ul., Peterhoff,
St. Petersburg, 198504, Russia

Wolfram Kollatschny
Institut für Astrophysik Göttingen,
Georg-August-Universität Göttingen
Friedrich-Hund-Platz 1, 37077
Göttingen, Germany
wkollat@astro.physik.uni-goettingen.de

Jelena Kovačević
Astronomical Observatory Belgrade
Volgina 7, Belgrade, Serbia
jkovacevic@aob.bg.ac.yu

Andjelka Kovačević
Department of Astronomy, Faculty of Mathematics, University of Belgrade
Studentski trg 16, Belgrade, Serbia
andjelka@matf.bg.ac.yu

Milan Kuraica
Faculty of Physics, University of Belgrade
P.O. Box 368, 11 000 Belgrade, Serbia

Giovanni La Mura
Dipartimento di Astronomia, Universita di Padova
Vicolo dell'Osservatorio 2, 35122
Padova, Italy
giovanni.lamura@unipd.it

Evaggelia Lyratzi
University of Athens, Faculty of Physics, Department of Astrophysics, Astronomy and Mechanics
Panepistimiopolis, Zografos 157 84, Athens - Greece
elyratzi@phys.uoa.gr

Walid Foued Mahmoudi
Faculté des Sciences de Bizerte, 7021 Zarzouna, Bizerte, Tunisia
walidfoued@yahoo.fr

Olga Merkulova
Saint-Petersburg State University
Russia, St.Petersburg, Universitetskiy pr., 28
olga_merkulova@list.ru

Anatolij A. Mihailov
Institute of Physics
Pregrevica 118, Zemun, Belgrade, Serbia
mihajlov@phy.bg.ac.yu

Žarko Mijajlović
Faculty of Mathematics, University of Belgrade
Studentski trg 16, Belgrade, Serbia
zarkom@matf.bg.ac.yu

Vladimir Milosavljević
Faculty of Physics, University of Belgrade / NCPST, School of Physics
vladimir@physics.dcu.ie,
vladimir@ff.bg.ac.yu

Nenad Milovanović
Astronomical Observatory Belgrade
Volgina 7, Belgrade, Serbia
nmilovanovic@aob.bg.ac.yu

Alexei Moiseev
Special Astrophysical Observatory of RAS
Nizhnij Arkhyz, Zelenchukskaya, Karachaevo-Cherkesia, Russia 369167
moisav@sao.ru

Slobodan Ninković
Astronomical Observatory Belgrade
Volgina 7, Belgrade, Serbia
sninkovic@aob.bg.ac.yu

Bratislav Obradović
Faculty of Physics, University of Belgrade
P.O. Box 368, 11 000 Belgrade, Serbia
obrat@ff.bg.ac.yu

Gillian Peach
Department of Physics and Astronomy, University College London
Gower Street, London WC1E 6BT, UK
g.peach@ucl.ac.uk

Nada Pejović
Department of Astronomy, Faculty of Mathematics, University of Belgrade
Studentski trg 16, Belgrade, Serbia
nada@matf.bg.ac.yu

Zoran Petrović
Institute of physics
Pregrevica 118, Zemun, Belgrade, Serbia
zoran@phy.bg.ac.yu

Luka Č. Popović
Astronomical Observatory Belgrade
Volgina 7, Belgrade, Serbia
lpopovic@aob.bg.ac.yu

Dušan Popović
Faculty of Physics, University of Belgrade
P.O. Box 368, 11 000 Belgrade, Serbia
dusan@ff.bg.ac.yu

Philippe Prugniel
CRAL-Observatoire de Lyon
9 Av. C. André, 69561 Saint-Genis Laval, France
prugniel@obs.univ-lyon1.fr

Jagoš Purić
Faculty of Physics, University of Belgrade
P.O. Box 368, 11 000 Belgrade, Serbia
jpuric@sezampro.yu

Piero Rafanelli
Dipartimento di Astronomia, Universita di Padova
Vicolo dell'Osservatorio 2, 35122 Padova, Italy
piraf@pd.astro.it

Mikhail Sachkov
Institute of astronomy RAS
48 Pyatnitskaya str., 119017 Moscow Russia
msachkov@inasan.ru

Nenad Sakan
Institute of Physics
Pregrevica 118, Zemun, Belgrade, Serbia
nsakan@phy.bg.ac.yu

Mara Šćepanović
Faculty of Sciences and Mathematics, University of Montenegro
P.O. Box 211, 81 000 Podgorica, Montenegro

Zoran Simić
Astronomical Observatory Belgrade
Volgina 7, Belgrade, Serbia
zsimic@aob.bg.ac.yu

Saša Simić
University of Kragujevac, Faculty of Science, Department of Physics
Radoja Domanovića 12, 34000 Kragujevac
ssimic@kg.ac.yu

Aleksandrina Smirnova
Special Astrophysical Observatory of RAS
Nizhnij Arkhyz, Zelenchukskaya, Karachaevo-Cherkesia, Russia 369167
alexiya@sao.ru

Vladimir Srećković
Institute of Physics
Pregrevica 118, Zemun, Belgrade, Serbia
vlada@phy.bg.ac.yu

Ilija Stefanović
Institute for Experimental Physics II, Ruhr University Bochum
Geb. NB5/66, 44780 Bochum, Germany
ilija.stefanovic@rub.de

Paolo Tozzi
INAF Osservatorio Astronomico di Trieste
via Tiepolo 11, I-34131 Trieste, Italy
tozzi@oats.inaf.it

Dejan Urošević
Department of Astronomy, Faculty of Mathematics, University of Belgrade
Studentski trg 16, Belgrade, Serbia
dejanu@matf.bg.ac.yu

Sonja Vidojević
Department of Astronomy, Faculty of Mathematics, University of Belgrade
Studentski trg 16, Belgrade, Serbia
sonja@alas.matf.bg.ac.yu

Branislav Vukotić
Astronomical Observatory Belgrade
Volgina 7, Belgrade, Serbia
bvukotic@aob.bg.ac.yu

Alexander Zakharov
State Scientific Center - Institute of Theoretical and Experimental Physics
B. Cheremushkinskaya, 25, Moscow, 117259, Russia
zakharov@itep.ru

CONFERENCE PROGRAMME

Sunday, June 10

Arrival to Sremski Karlovci and accommodation in hotels (Dunav, Boem)

Monday, June 11

09:30-10:00	***Opening ceremony***	
	Chairman: M. S. Dimitrijević	
10:00-10:30	Peach, G.	Recent work on line shapes for the spectra of cool stars (IL)
10:30-11:00	Purić, J.	Stark parameters regularities of multiply charged ion spectral lines originating from the same transition array (IL)
11:00-11:30	***Coffee break***	
	Chairwoman: G. Peach	
11:30-12:00	Ivezić, Z.	SDSS spectroscopic survey(s) (IL)
12:00-12:30	Barklem, P.	The broadening of spectral lines by collisions with neutral hydrogen atoms in cool stars (IL)
12:30-13:00	Tozzi, P.	Emission lines in X-ray spectra of Cluster of Galaxies (IL)
13:00-14:30	***Lunch***	
	Chairman: Z. Ivezić	
14:30-15:00	Chartas, G.	Absorption line diagnostics of quasar outflows (IL)
15:00-15:15	Jovanović, P.	The shape of the Fe Kα spectral line in the case of partly obscured accretion disk (ST)
15:15-15:30	Chatzichristou, E.	Studying the complex absorption and emission lines in AGN spectra (ST)
15:30-16:00	***Coffee break***	
	Chairman: E. Danezis	
16:00-16:30	Rafanelli, P.	3D spectroscopy of nuclear and extra-nuclear regions of nearby AGN (IL)
16:30-16:45	La Mura, G.	Detailed analysis of Balmer lines in a selected sample of 90 broad line AGN (ST)
16:45-17:00	Ilić, D.	Physical properties of the BLR region: BP vs. CLOUDY calculations (ST)
17:00-19:00	***Visit of Sremski Karlovci***	
19:00-	***Welcome coctail***	

Tuesday, June 12

	Chairman: J. Purić	
09:30-10:00	Petrović, Z.	Electron, ion and atom collisions leading to anomalous Doppler broadening in hydrogen and hydrogen rare gas mixtures (IL)
10:00-10:30	Christova, M.	On the broadening of spectral lines in surface waves sustained discharges (IL)
10:30-10:45	Boretskij, V.F.	Shapes of spectral lines of nonuniform plasma of electric arc discharge between copper electrodes (ST)
10:45-11:00	Dojčinović, I.	Spectroscopic study of plasma flow from magnetoplasma compressor operated in nitrogen (ST)
11:00-11:30	***Coffee break***	
	Chairman: J. Chartas	
11:30-12:00	Kollatschny, W.	Line profile variability in AGN (IL)
12:00-12:30	Prugniel, P.	Modeling the spectrum of the stellar population in star forming and active galaxies (IL)
12:30-12:45	Simić, S.	Spectral lines in the afterglow of Gamma Ray Bursts (ST)
12:45-13:00	Bon, E.	The Broad Hα and Hβ emission line shapes in an AGN sample (ST)
13:00-14:30	***Lunch***	
	Chairman: D. Jevremović	
14:30-15:00	Stefanović, I.	Plasma analogue for astrophysical dust (IL)
15:00-15:15	Homeier, D.	Collisional Broadening of Na I in Metal-rich White Dwarfs - Beyond the Single Perturber Approximation (ST)
15:15-15:30	Dimitrijević, M. S.	Stark broadening of Cr II spectral lines in stellar atmospheres (ST)
15:30-15:45	Johnas, C.	Application of line profile functions to synthetic spectra of cool and hot stellar objects (ST)
15:45-16:00	Milovanović, N.	Cowan code and Stark broadening of spectral lines of S II, S III and S IV (ST)
16:00-16:30	***Coffee break***	
17:00-20:00	***Visit of Novi Sad***	

Wednesday, June 13

Excursion

Thursday, June 14

	Chairman: P. Rafanelli	
09:30-10:00	Moiseev, A.	The jet-clouds interaction in AGN: a panoramic spectroscopy view (IL)
10:00-10:30	Ninković, S.	Studies of Local Milky-Way Kinematics via line-of-sight velocities (IL)
10:30-10:45	Smirnova, A.	Mrk 334: Connection between nuclei activity and merging of a companion (ST)
10:45-11:15	***Coffee break***	
	Chairwoman: F. Allard	
11:15-11:45	Danezis, E.	The DACs and SACs effects from stars to Quasars. Some first general notices (IL)
11:45-12:15	Sachkov, M.	Pulsation tomography of roAp stars (IL)
12:15-12:30	Lyratzi, E.	The evolution of some physical parameters in the DACs/SACs regions in Be stellar atmospheres (ST)
12:30-12:45	Vidojević, S.	Correlation line-of-sight velocity-metallicity in a sample of stars with possible planetary systems (ST)
12:45-14:30	***Lunch***	
	Chairman: P. Prugniel	
14:30-15:00	Ben Nessib, N.	Experimental and theoretical determination of temperature in plasmas (IL)
15:00-15:30	Klyucharev, A.N.	Chemi-ionization processes. Alkali-metal geocosmical plasmas (IL)
15:30-15:45	Sakan, N.	The modeling of the continuous emission spectrum of a dense non-ideal plasma in optical region (ST)
15:45-16:00	Šćepanović, M.	Stark parameters regularities within spectral series of different atoms and ions (ST)
16:00-16:30	***Coffee break***	

Chairman: N. Ben Nessib

16:30-18:15 **Posters (each poster 5 minute)**

Antoniou, A.: A statistical study of physical parameters of the C IV density regions in 20 Oe stars

Antoniou, A.: Investigation of the post coronal density regions of Oe stars, through the N V UV resonance lines

Antoniou, A.: Long term variability of the coronal and post-coronal regions of the Oe star HD 149757 (zeta Oph)

Antoniou, A.: The N IV density regions in the spectra of 20 Oe stars

Arbutina, B.: Radial dependence of extinction in parent galaxies of supernovae

Cvetanović, N.: A simple Monte-Carlo simulation of excessive Doppler broadening of the Hα line

Dimitrijević, M. S.: Determination of the gas temperatire of an argon microwave plasma at atmosphere pressure usin Van der Waals broadening

Elabidi, H.: Quantum-mechanical calculations of Ne VII spectral line widths

Gavrilović, N.: Connection between central black hole and circum-nuclear gas kinematics: The case of AGN with double-peaked lines

Hamdi, R.: Atomic data and Stark broadening parameters in Si VI ion

Jevremović, D.: The influence of ion-atom and atom-Rydberg atom processes to the continuous and line spectra of star's atmospheres

Kovačević, A.: Lag between the optical continuum and line variabilities of NGC 4151

Kovačević, J.: Asymmetry of the C IV 1549 line in a sample of RQ and RL AGN

Mahmoudi, W,: Calculation of the multiplet factor $l_1^n(L_nS_n)\ l_2^m(L_mS_m)\ l_3^p(L_pS_p)$ in LS-coupling

Merkulova, O.: Studying of some candidates to polar-ring galaxies by the methods of 2D-spectroscopy

Mijajlović, Z.: Stellar spectroscopy on the New Astronomical Station at the mountain Vidojevica

Milosavljević, V.: Gas temperature measurement in oxygen-nitrogen plasmas diluted by hydrogen

Obradović, B.: Electric field measurements in dielectric barrier discharge operated in nitrogen

Simić, Z.: Experimental and theoretical Stark widths for Au II

Urošević, D.: Optical search for supernova remnants in M81, M82 and NGC 3077

Vidojević, S.: An analysis of Local Milky-Way kinematics based on proper-motion and line-of-sight velocity data

19:00 ***Conference dinner***

Friday, June 15

	Chairman: W. Kollatschni	
09:30-10:00	Allard, F.	The K I λ =7667, 7701 Å doublet profile in brown dwarfs: Results using new molecular potentials (IL)
10:00-10:30	Danziger, J.	Profiles in Novae spectra (IL)
10:30-11:00	Zakharov, A.	The Fe Kα line simulations for BHs: The simplest model (IL)
11:00-11:30	***Closing ceremony (L. Č. Popović, M. S. Dimitrijević)***	
12:00-13:00	***Lunch***	
13:00-	***Optionally excursion and back to Belgrade***	

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