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Employment

- **Institute of Nuclear Sciences Vinča, University of Belgrade, Serbia
Group for Experimental High Energy Physics, Laboratory of Physics**
 - Research Assistant Professor, December 2018 -
 - Research Assistant, April 2009 - February 2014
- **Institute of Chemistry, Technology and Metallurgy, University of Belgrade, Serbia**
 - Research Assistant Professor, February 2017 - December 2018
- **Institute of Physics, University of Belgrade, Serbia**
 - Research Assistant, February 2014 - February 2017
- **Laboratoire d'Annecy-le-Vieux de Physique des Particules, Annecy, France**
 - French Government Fellow, October 2009 - August 2010

Education

- **University of Belgrade, Faculty of Physics, Republic of Serbia**
 - Doctoral studies, Physics of Particles and Fields (enrolled): 2008/2009
 - Work on thesis (started): September, 2011
Work on thesis: Measurement of CP violation in the decay $B_s^0 \rightarrow J/\psi\phi$ with the ATLAS experiment
 - Ph.D. in Physics (thesis defended): June 10, 2016
Thesis title: "Precision measurement of CP violation in $B_s^0 \rightarrow J/\psi\phi$ decay at the ATLAS experiment"
Doctoral studies GPA: 9.80/10
Faculty exams (during doctoral studies): 1. Standard Model; 2. Detectors;
3. Methods of Simulation and Data Processing; 4. Astroparticle Physics; 5. Nuclear Physics
- **University of Novi Sad, Faculty of Sciences, Department of Physics, Republic of Serbia**
 - Graduate Degree in Physics (equated with Master II degree): May 19, 2005
Thesis title: "Determination of energy and flux of cosmic muons at sea level"
First-Class Honors; Graduate studies GPA (including the final exam): 9.40/10

Conferences/Invited Talks/Posters

Conferences:

- 27th International Symposium on Lepton Photon Interactions at High Energies (LP 2015), Ljubljana, Slovenia,
Via ATLAS speakers committee:
"Measurement of the CP -violating phase ϕ_s in $B_s^0 \rightarrow J/\psi\phi$ decays with the ATLAS detector"
- 22nd International Workshop on Deep-Inelastic Scattering and Related Subjects (DIS 2014), Warsaw, Poland,
Via ATLAS speakers committee:
"Study of Λ_b^0 decay properties with the ATLAS detector", conference proceedings: PoS(DIS2014)182.
- 11th International Conference on Heavy Quarks and Leptons (HQL 2012), Prague, Czech Republic,
Via ATLAS speakers committee:
"CP Violation at ATLAS", conference proceedings: PoS(HQL 2012)038.
- 14th International Conference on B-Physics at Hadron Machines (Beauty 2013), Bologna, Italy
Via ATLAS speakers committee:
"Flavour Tagging and Systematics for $B_s^0 \rightarrow J/\psi\phi$ Measurement in ATLAS",
conference proceedings: PoS(Beauty 2013)070.
- 12th Congress of Serbian Physicists (KFS 2013), Vrnjacka Banja, Republic of Serbia (in native language):
"Measurement of the CP violating phase ϕ_s and the decay width difference $\Delta\Gamma_s$ in the decay $B_s^0 \rightarrow J/\psi\phi$ at the ATLAS experiment", conference proceedings: ISBN 978-86-86169-08-2, pp. 212-216 (2013).
- 49th Conference on Electronics, Telecommunications, Computers, Automatic Control and Nuclear Engineering (ETRAN 2005), Budva, State Union of Serbia and Montenegro (in native language):
"Spectroscopy of antimuon plastic scintillation detector SCIONIX",
conference proceedings: Proc. 49th ETRAN Conf., Vol. IV pp. 58 - 61 (2005).

Workshops:

- $B_s^0 \rightarrow J/\psi\phi$ and B-flavour charge tagging Workshop, December 2012, CERN:
"PDF with Helicity angles for $B_s^0 \rightarrow J/\psi\phi$ and S-wave contribution"
- $B_s^0 \rightarrow J/\psi\phi$ Workshop, November 2011, CERN:
"Status on systematics due to non-flat background $B_d^0 \rightarrow J/\psi K^*$ "

ATLAS P&P weeks:

- B-physics meeting in Physics and Performance Week, March 2, 2012, CERN
" $B_s^0 \rightarrow J/\psi$ group status" (reports from subgroups)

Computing skills (Analysis/Simulations)

- Statistical analysis: ROOT (OO design)/PAW packages
- Programming languages: C++, Python
- Monte Carlo methods: simulation of physical events
- Databases (courses): MS Access, MS Excel
- Applications (selected): LaTeX, Vi, Origin/ Mathematica, MS/Open Office
- Operating systems: Linux/Unix, Windows

International schools

- 2014 Danube School on Instrumentation in Elementary Particle & Nuclear Physics, Novi Sad, Serbia
- 2013 CERN-Fermilab HCP Summer School, CERN, Geneva, Switzerland
- 2011 European School of High-Energy Physics, ESHEP, Cheile Gradistei, Romania
- 2005 Summer School on Particle Physics, ICTP, Trieste, Italy

Research Experience

From the moment when the LHC began to operate in 2009, thus opening a new era in particle physics, two general purpose detectors, ATLAS and CMS, succeeded to complete the picture of particles and forces described by the Standard Model of elementary particles (SM), by identifying the new particle - Higgs boson. Even though the SM is consistent with all experimental results confirmed so far, the theory has its limitations and puzzles still remain, such as explanation of the origin of dark matter, generation mechanism of matter-antimatter asymmetry, the neutrino mass, the strength of the gravitational coupling constant etc. To explain the imbalance of baryon and antibaryon matter in the observable Universe, Sakharov's conditions should be satisfied, one of which is Charge-Parity (CP) violation. While CP violation is predicted in the SM, theoretical calculation as well as experimental measurement shows that the level of CP violation predicted is insufficient to account for the observed degree of asymmetry. It is therefore widely expected that one sign of new physics will be an observation of CP violation effects incompatible with the SM predictions. Measurement searching for new physics contribution in the violation of CP symmetry with the ATLAS experiment have been a core component of my work throughout my PhD studies.

Time dependent CP violation in strange-beauty meson decay : In the SM, CP violation originates from an irreducible complex phase in the Cabibbo-Kobayashi-Maskawa quark mixing matrix (CKM). To determine the size of CP -violating effect in B_s^0 system by extracting the CP -violating phase ϕ_s I have contributed in the measurement of time dependent CP violation with $B_s^0 \rightarrow J/\psi\phi$ decays in ATLAS experiment. In the SM the phase ϕ_s is small and can be related to the elements of the CKM matrix via the relation $\phi_s \simeq -2\beta_s$. As this phase is predicted to be small in the SM, this measurement is highly sensitive probe of new physics, discovery of which is only possible if the analysis is accomplished at unprecedentedly high precision, comprising both detector performance and physics analysis. In this case the CP violation occurs in the interference between the mixing of B_s^0 mesons and their decay. To perform precision measurement using $B_s^0 \rightarrow J/\psi\phi$ decay in ATLAS, the tagged time-dependent angular analysis is needed. The related self-tagging decay mode $B^\pm \rightarrow J/\psi K^\pm$ is used to calibrate the determination of the production flavor of the B . Being a vector-vector final state an angular analysis is required to disentangle CP odd and even contributions. The proper separation of background where I importantly contributed presents an important part of this analysis. The appropriate modeling of mass, lifetime and angular distributions of both signal and background components, dedicated background components fraction estimation, as well as utilization of the flavor tagging methods, resulted in the second world's most precise measurement of CP -violating effect in B_s^0 system, showing its capability to be complementary as well as competitive to LHCb.

Development of algorithms for the simulation of pile-up events in the ATLAS muon spectrometer : The prompt signal from proton-proton collisions in the ATLAS detector is collected over a few hundred nanoseconds. However, long after the collisions a gas of low energy neutrons and photons emitted by the calorimeters is still present in the cavern. This gas is generally referred to as "cavern background", where in the material of the muon spectrometer these neutrons and photons undergo conversions giving rise to charged particles. In the muon spectrometer trigger rates, detector occupancy and momentum resolution are strongly affected by high cavern background rates, that will increase as the peak luminosity evolves. This background can be understood and predicted by a full simulation of the detector response, as well from the experience gained in the first years of running. I authored the development of the software package for the simulation of cavern background events, designed for pile-up digitization studies. The algorithm is built to simulate the muon spectrometer response in

all four chamber technologies and to produce Raw Data Outputs (RDOs). This is called Detector Electronics Simulation, known as digitization in the ATLAS production chain.

Luminosity measurement at ILC : A high energy e^+e^- linear collider is considered to be the future research facility complementary to the LHC. Physics requirements like production cross-section, electroweak physics and new physics searches require the high precision of luminosity measurement at a future linear collider. Luminosity will be measured using Bhabha scattering that is dominantly QED process at ILC energies. The precision of luminosity measurement is limited both by the reconstruction of Bhabha events as well as by physics effects (beam-beam effects, presence of physics background). I authored in the analysis of the four-fermion production as one of the main sources of systematic uncertainties on the luminosity measurement at ILC. Four-fermion production is known to have a large cross section with maximum on low polar angles. I used the WHIZARD event generator to obtain sample of events for final state with leptons and BHLUMI event generator to generate Bhabha event sample, while the luminometer response is simulated using BARBIE, a GEANT3 based simulation program. By optimizing selection criteria for Bhabha events, four-fermion events in the luminometer are to a large fraction rejected. Including additional source of systematic uncertainties, it is shown that it will be possible to measure integrated luminosity at ILC with the total systematic uncertainty of $\sim 10^{-3}$.

Micromegas chambers for application in hadronic calorimetry at future linear collider - chambers prototypes tests in particle beams at CERN : Gaseous detectors that are extensively employed at HEP experiments have limitations which may prevent their utilization in future experiments. Apart from limited spatial resolution, present-day techniques have disadvantage in coping with the expected high-flux rates, radiation-hardness and production costs. Micro-structured gaseous amplifying detectors achieve unprecedented spatial resolution and enable a new era in pursuing new detector concepts and their applications. The inventions of one of the concepts, Micro-Mesh Gaseous Structure (Micromegas), offers the possibility to develop new gaseous detectors that are position sensitive, radiation hard, with high rate capability and operational stability. During my stay at LAPP, I was involved in test beam studies of the Micromegas chambers prototype at CERN in 2010, with main objective to validate its mechanical design, to test main functionalities of the readout electronics and DAQ and to evaluate chamber general performance, such as detector efficiency, gain uniformity, hit multiplicity and study of the prototype response in electromagnetic showers. The test beams were carried out at CERN SPS H4 beam line where chambers were exposed to high momentum muons of 150 GeV/c.

Spectroscopy based on antimuon plastic scintillation detector : Gamma spectroscopy is a commonly used method in nuclear and particles physics, astrophysics, geophysics, environmental sciences, and in other fields of science. Background radiation in γ -spectrometer systems arises mainly from the secondary radiation produced by the cosmic ray muons. This component of background can not be reduced by increasing the thickness of the passive protection (Pb). Hence, an active shielding system is used to reduce the cosmic ray background mainly induced by cosmic muons, where it is supposed to use scintillation detectors of large area located outside the lead shielding (i.e. Veto detectors). To monitor the intensity of the secondary cosmic radiation and its variations, these experiments require a special detector equipment of high sensitivity which enables to distinguish events caused by cosmic radiation from other radiation-induced events from the environment. I was involved in the examination of spectroscopic characteristics of one of the special detectors designed for this purpose - a plastic based SCIONIX detector aperture - making the active protective shielding in the low-background laboratory on the surface. My research work included determination of background radiation characteristics such as the energy and flux of cosmic muons at sea-level, and additional analysis concerning the interaction of cosmic radiation with material, such as muon energy loss by ionization and excitation when passing through the detector material.

Involvement in the ATLAS detector and software operation : Essential work prior the physics analysis is to monitor the detector performance and the quality of data being taken, by performing online and offline shifts. During my PhD studies I underwent the following shifts: ATLAS Control Room shifts: Online Data Quality; Remote shifts: b-tagging DQ and general offline DQ shifts, B-trigger offline software validation shifts.

Awards and Leadership Roles

- French Government Fellow, October 2009 - August 2010
- Deputy Team Leader of HEP Group in ATLAS experiment, Institute of Nuclear Sciences Vinca, (2010 - 2013)

Teaching Experience

- **Zemun Gymnasium, Zemun**, 2018/2019, Special Class for Gifted Pupils in Physics, Course: Physics of the Microworld.
- **Gymnasium J. J. Zmaj, Novi Sad**, 2004, Natural Sciences and Mathematical Department - Graduates, Course: Physics.
- **Institute of Physics, Zemun**, March, 2015, Seminar on Contemporary physics in research, teaching and application intended for the teachers, educators and professional associates, during which I was involved in the exercises on experimental techniques in high energy physics.
- **Faculty of Sciences, Novi Sad**, March, 2015, International Masterclasses in Particle Physics at ATLAS experiment, involvement in preparation and serving as a demonstrator of the exercises.

List of publications

• Research Papers - International Journals:

- (1) H. Abramowicz, ... , T. Jovin *et al.*, *Forward instrumentation for ILC detectors*, 2010 JINST 5 P12002 [arXiv:1009.2433] [INSPIRE].
- (2) G. Aad, ... , T. Jovin *et al.* [ATLAS Collaboration], *Time-dependent angular analysis of the decay $B_s^0 \rightarrow J/\psi\phi$ and extraction of $\Delta\Gamma_s$ and the CP-violating weak phase ϕ_s by ATLAS*, JHEP 12 (2012) 072 [arXiv:1208.0572] [INSPIRE].
- (3) G. Aad, ... , T. Agatonovic-Jovin *et al.* [ATLAS Collaboration], *Flavour tagged time dependent angular analysis of the $B_s^0 \rightarrow J/\psi\phi$ decay and extraction of $\Delta\Gamma_s$ and the weak phase ϕ_s in ATLAS*, Phys. Rev. D 90 (2014) 052007 [arXiv:1407.1796] [INSPIRE].
- (4) G. Aad, ... , T. Agatonovic-Jovin *et al.* [ATLAS Collaboration], *Measurement of the CP-violating phase ϕ_s and the B_s^0 meson decay width difference with $B_s^0 \rightarrow J/\psi\phi$ decays in ATLAS*, JHEP 08 (2016) 147 [arXiv:1601.03297] [INSPIRE].

• Monographic study/chapter in book or research in the thematic proceedings of the leading international importance:

- (1) H. Stoeck, ... , T. Jovin, *et al.* [the ILD concept group], *The International Large Detector: Letter of Intent*, DESY 2009/87, Fermilab PUB-09-682-E, KEK Report 2009-6, ISSN 0418-9833; ISBN 978-3-935702-42-3 (2010), ILD (ILC) - Letter of Intent 2010.

• Proceedings - International Conferences/Workshops:

- (1) T. Agatonovic-Jovin [On behalf of the ATLAS Collaboration], *Study of Λ_b^0 decay properties with the ATLAS detector*, PoS(DIS2014)182.

- (2) Tatjana Agatonovic-Jovin [On behalf of the ATLAS Collaboration], *Flavour Tagging and Systematics for $B_s^0 \rightarrow J/\psi\phi$ Measurement in ATLAS*, PoS(Beauty 2013)070.
- (3) Tatjana Jovin [On behalf of the ATLAS Collaboration], *CP Violation at ATLAS*, PoS(HQL 2012)038.
- (4) H. Abramowicz, P. Bambade, I. Bozovic-Jelisavcic, B. Pawlik, C. Rimbault, T. Jovin *et al.*, *Luminosity Measurement at ILC*, accepted as the eConf Proceedings of the International Linear Collider Workshop 2010 LCWS10 & ILC10, Beijing 2010, arXiv:1006.2539 [physics.ins-det].
- (5) I. Bozovic-Jelisavcic, M. Pandurovic, I. Smiljanic, T. Jovin, I. Sadeh, *Forward region studies for ILC*, 7th International Conference of the Balkan Physical Union, 9 - 13 September 2009, Alexandroupolis, Greece, AIP Conf. Proc. **1203**, 49 (2010).
- (6) I. Bikit, D. Mrdja, N. Todorovic, J. Slivka, M. Veskovic, M. Krmar, T. Jovin *et al.*, *Background reduction at an actively shielded gamma ray spectrometer*, Proceedings of the 20th International Nuclear Physics Divisional Conference of the European Physical Society, Debrecen, Hungary, May 16 - 20, 2005, ISBN 2-914771-23-1, Vol.29A pp.83.

- **Proceedings - National Conferences/Workshops:**

- (1) T. Agatonović-Jovin *et al.* [On behalf of the ATLAS Collaboration], *Measurement of the CP violating phase ϕ_s and the decay width difference $\Delta\Gamma_s$ in the decay $B_s^0 \rightarrow J/\psi\phi$ at the ATLAS experiment*, 12th Congress of Serbian Physicists, April 28 - May 2, 2013, Vrnjacka Banja, Serbia, ISBN 978-86-86169-08-2, pp. 212-216 (2013).
- (2) T. Agatonović-Jovin *et al.* [On behalf of the ATLAS Collaboration], *Flavour tagging in the CP violation measurement at the ATLAS experiment*, 12th Congress of Serbian Physicists, April 28 - May 2, 2013, Vrnjacka Banja, Serbia, ISBN 978-86-86169-08-2, pp. 256-259 (2013).
- (3) Tatjana Jovin, Nataša Žikić-Todorović, Sofija Forkapić, Ljiljana Čonkić, Miodrag Krmar, *Antimuon spectroscopy based on a plastic detector*, 49th Conference on Electronics, Telecommunications, Computers, Automatic Control and Nuclear Engineering, ETRAN Conference, Budva, Serbia and Montenegro, June 5 - 10, 2005, Proc. 49th ETRAN Conf., Vol. IV pp. 58 - 61 (2005).

- **Conference notes (ATLAS):**

- (1) A. Barton, ..., M. Smizanska, ... , T. Jovin *et al.*, *Flavour tagged time dependent angular analysis of the $B_s^0 \rightarrow J/\psi\phi$ decay and extraction of $\Delta\Gamma$ and the weak phase ϕ_s in ATLAS*, April 12, 2013, pp. 18, ATLAS-CONF-2013-039.

- **Supporting Internal notes (ATLAS):**

- (1) A. Barton, ..., M. Smizanska, ... , T. Jovin *et al.*, *Time dependent angular analysis of $B_s^0 \rightarrow J/\psi\phi$ decay and extraction of $\Delta\Gamma_s$ and the CP violating weak phase ϕ_s in ATLAS*, May 10, 2012, pp. 58, ATL-COM-PHYS-2012-155.
- (2) A. Barton, ..., M. Smizanska, ... , T. Agatonovic-Jovin *et al.*, *Time dependent angular analysis of $B_s^0 \rightarrow J/\psi\phi$ decay and extraction of $\Delta\Gamma_s$ and the weak phase of B_s^0 meson in ATLAS*, March 5, 2013, pp. 77, ATL-COM-PHYS-2013-293.
- (3) A. Barton, ..., M. Smizanska, ... , T. Agatonovic-Jovin *et al.*, *Flavour tagged time dependent angular analysis of the $B_s^0 \rightarrow J/\psi\phi$ decays and extraction of $\Delta\Gamma_s$ and the weak phase ϕ_s in ATLAS*, January 11, 2016, pp. 106, ATL-COM-PHYS-2014-598.