

Curriculum Vitae

Violeta Gika

National Technical University of Athens
School of Applied Mathematics and Physical
Science

Phone: +30-694-652-6390 (cell)
+30-210-772-1747 (office)
e-mail: guika@mail.ntua.gr

EDUCATION

Ph.D., High Energy Physics, National Technical University of Athens, 2010.

Title of Dissertation: “*Atmospheric Fluorescence Yield in Ultra High Energy Cosmic Rays – Phenomenology and experimental study*”.

Dissertation Committee: E. Fokitis (supervisor), S. Maltezos, D. Karabourniotis.

M.Sc., Physics (Astrophysics, Astronomy, Mechanics), University of Athens, 1999.

B.Sc., Rural and Surveying Engineering

RESEARCH INTERESTS

Experimental Particle Physics in particle accelerators
Astroparticle Physics - Ultra High Energy Cosmic Rays and VHE gamma ray
Astronomy.

TEACHING

“Lab for Physics II”, NTUA School of Mechanical Engineering, 2010, 2005

“Lab for Physics I”, NTUA School of ATM Engineering, 2009

“Lab for Physics II”, NTUA School of Chemical Engineering, 2006, 2005

“Lab Physics I”, NTUA School of Applied Mathematics and Physical Science, 2005

Supervising Diploma Work

Participation in three Diploma Works at the Physics Department of National
Technical University of Athens.

RESEARCH EXPERIENCE

ULTRA HIGH ENERGY COSMIC RAY PHENOMENOLOGY (2006 – today)

- Primary energy determination method and experimental investigation of the atmospheric fluorescence yield. The accuracy of the energy depends on a set of parameters relevant to the EAS reconstruction method. Use of optical emission spectroscopy for the study molecular nitrogen spectral band systems using a spectral lamp operating in the low pressure air glow electrical discharge mode. The sensitivity of the spectrograph is maximized using a CCD sensor cooled at the region of liquid nitrogen temperature.
- Experience in the design and exploitation of Echelle-type spectrographs for applications for the determination of the atmospheric fluorescence yield and the recording of night sky background radiation.
- Development of a high-resolution and high sensitivity UV spectrograph for the recording of the rovibrational bands of nitrogen molecule. This spectrograph can be used for the air fluorescence yield determination using electron beam produced by accelerators. Analysis method of the molecular spectra for determining the rotational temperature of the gas excitation process based on multi-parametric fitting with theoretical models. This method of measuring the rotational temperature from the obtained molecular spectra is a non-invasive and reliable method and can be applied in electron beam accelerator experiments.
- Study of Extensive Air Shower simulations produced by UHECR primary particles in the region of the highest energy limit (GZK cutoff) using the AIRES simulation package.

ATMOSPHERIC MONITORING FOR UHECR AND VHE GAMMA RAY ASTRONOMY (2006-today)

- Significant experience has been acquired in the research of atmospheric monitoring for the UHCR observatories and VHE gamma ray Astronomy Observatories. In particular, I worked on the development of optical setups for crossing Fabry-Perot interferometers with high-resolution spectrographs, where innovative analysis techniques have been developed and applied. This instrumentation can help on the characterization of the receiver channels (etalons) of a High Spectral Resolution Lidar appropriate to separate the aerosol and molecular scattering signals.

MUON CHAMBERS FOR LHC- ATLAS (2002 – 2005)

- I have participated in the quality control measurements and quality assurance of the Monitored Drift Tubes (MDT) of the Muon Spectrometer of LHC-ATLAS of CERN made by High Energy Group of NTUA. The MDTs should

meet the particular specifications concerning the following four subjects: the position and the mechanical tension of the wire, the high voltage leakage current and the gas leak rate. Laboratory tests of the temperature sensors of Muon Chambers via the PVSS II control system.

- Simulation Studies of the Muon Chambers with GEANT 4 in order to conclude about the response of the chambers in the cosmic muons exposure.
- Contribution in the development of the setup for the study of the MDT chamber under an environment of energetic neutrons produced at the beam of TANDEM accelerator at Democritos Research Center.

RESEARCH PROGRAMS

- “PYTHAGORAS II”, with title “Study of the High Energy Cosmic Ray Radiation - Pierre Auger Observatory”. Funding by Ministry of Education, 2004 -2007.
In the framework of this program I have contributed on the simulation studies of longitudinal distribution of the extensive air showers in order to determine the energy from the primary particles of protons, iron nuclei and gamma rays.
- “THALIS 2009”, with title “Astroparticle Physics with Imaging Atmospheric Cherenkov Technique (IACT) – Contribution in the Cherenkov Telescope Array (CTA)”.
Funding by Ministry of Education.
The proposal has not been evaluated yet.
In the frame of this proposal I participated in writing the scientific proposal mainly in the subjects of the simulations of extensive air showers and other relevant tasks.
- Submission of a research project in the frame of the program “Support of Postdoctoral Researchers ” with the title “Unveiling the origin of mass through the Higgs boson discovery at the LHC” with scientific collaborators Professor E. Gazis from NTUA and Professor S. Kabana from University of Nantes, France.
The proposal has not been evaluated yet.
- Submission of a research project in the frame of the program ESA (ISS for Exploration) with the title “Investigation of Technology assessment for upper atmosphere study on the International Space Station with emphasis on Resonance Metastable He (1083 nm) LIDAR” with scientific leader Professor E. Fokitis from NTUA.
The proposal has not been evaluated yet.

SCOLARSHIPS

Greek State Scholarship Foundation, Doctoral Fellowship, 2003-2005.

PROJECTS

“CP Symmetry Violation in the Kaon Decays and the N48 Experiment”, Project in the frame of Particle Physics course (2004). An oral presentation has been also given.

PUBLICATIONS

Internal notes:

1. T. Alexopoulos, E. Dris, T.A. Filippas, E.N. Gazis, V. Gika, E.C. Katsoufis, S. Maltezos, P. Savva, G. Tsiopolitis, E. Tzamariudaki, “*Gas System Assembly and its Certification for the Muon BIS-chambers of ATLAS Detector*”, ATL-COM-MUON-2004-015 (2004).

Publications in international journals with referees:

1. E. Fokitis, V. Gika, P. Fetfatzis, S. Maltezos, I. Kouretis and N. Antonakakis Spyropoulos, “*Plasma Source For The Emulation Of The Atmospheric Fluorescence Produced By The Secondaries Of Ultra High Energy Cosmic Ray Particles*”, Journal of High Temperature Material Processes, Volume 13, Issue 3, 2009, p. 323-328.
2. V. Gika, E. Fokitis, S. Maltezos, “*Dedicated Spectrograph for High Resolution Measurement of Air Fluorescence Yield in Accelerator Experiments*”, recently submitted to Nucl. Instr. And meth. In Physics A (NIMA). Publication in progress.

Publications in conference proceedings:

1. S. Maltezos, N. Maragos, E.Fokitis, V.Gika, A. Georgakopoulou, E. Koubli, G. Koutsourakis, “*High-Accuracy Determination of Fabry-Perot Effective Mirror Spacing Used for the Receivers of Atmospheric Monitoring in VHE Gamma Ray Astronomy*”, ICATPP10, Cosmic Rays for Particle and Astroparticle Physics, Vila Olmo, Como, Italy, 2010. To be published to the World Scientific Journal.
2. P. Fetfatzis, E. Fokitis, V. Gika, S. Maltezos, N. Maragos, A. Aravantinos, M. Kompitsas, “*Towards Comparison of RAMAN and HSRL LIDAR technique for CTA type Atmospheric Monitoring*”, ATMON10, Wisconsin, Madison, USA, (2010).
3. S. Maltezos, E.Fokitis, V.Gika, N. Maragos, G. Koutsourakis, E. Koubli and A. Aravantinos, “*Atmospheric Monitoring for Very High Energy Gamma*

Energy Cherenkov Telescopes based on HSRL: Development of High Accuracy Non-Invasive Etalon Characterization Techniques”, Proceedings of IPRD10, Siena, Italy , 2010. To be published at Nucl. Instr. and Meth. B.

4. S. Maltezos, E.Fokitis, V.Gika , P. Fetfatzis and D. Karabourniotis, “*Stigmatic and High-Resolution Spectrograph Optimized for Studying the Air-Fluorescence Yield in Electron Beam Accelerators*”, 31th ICRC09, Lodz, Poland, 2009. The proceedings have not been published yet.
5. E. Fokitis, P. Fetfatzis, A. Georgakopoulou, V. Gika, M. Kompitsas, S. Maltezos, I. Manthos, A. Papayannis, A. Aravantinos, “*Review of High Spectral Resolution Techniques for Measurements of the Aerosol Phase Function and Application in Extensive Air Shower Detector Atmospheric Monitoring* ”, 31th ICRC09, Lodz, Poland, 2009. The proceedings have not been published yet.
6. E. Fokitis, P. Fetfatzis, S. Galanis, V. Gika, A. Georgakopoulou, M. Kompitsas, G. Koutelieris, S. Maltezos, I. Manthos, K. Patrinos, A. Aravantinos, “*High Sensitivity Interferometer based on Fabry-Perot Etalons: Applications in Chemical Analysis*”, The 6th International Conference IMA09 Instrumental Methods of Analysis, Modern Trends and Applications, Athens, Greece, 2009. Proceedings have not published.
7. S. Maltezos, E. Fokitis, V. Gika P. Fetfatzis, G. Koutelieris and E. Galanis , “*Nitrogen Molecular Spectra of Air-Fluorescence Emulator using LN₂ Cooled CCD*”, Proceedings of the 11th ICATPP 2009 Astroparticle, Particle and Space physics, Detectors and medical physics Applications, Vila Olmo, Como, Italy, 2009. Published at World Scientific, 2010, p. 253-258.
8. S. Maltezos, E. Fokitis, P. Fetfatzis, A. Georgakopoulou, V. Gika, G. Koutelieris and I. Manthos, “*Design and Data Analysis Method of Receiver of HSRL for Atmospheric Monitoring in Ultra High Energy Cosmic Ray Experiment*”, Proceedings of the 11th ICATPP 2009 Astroparticle, Particle and Space physics, Detectors and medical physics Applications, Vila Olmo, Como, Italy, 2009. Published at World Scientific, 2010, p. 236-241.
9. E.Fokitis, V. Gika , P. Fetfatzis, S. Maltezos, I. Kouretis and N. Antonakakis Spyropoulos, “*Plasma Source For The Emulation Of The Atmospheric Fluorescence Produced By The Secondaries Of Ultra High Energy Cosmic Ray Particles*”, HTTP-10, Patras, Greece, 2008. This work has been also published at “*Journal of High Temperature Material Processes*”.
10. S. Maltezos, E. Drakakis, E. Fokitis, A. Geranios, V. Gika, D. Karabourniotis, N. Antonakakis Spyropoylos, “*Experimental Emulation of Air Fluorescence and Study of its Yield at Low Pressure Electrical Discharges*”, Proceedings of the 30th International Cosmic Ray Conference, Vol. 5 (HE part 2), p. 1129–1132, Mexico City, Mexico, 2008.
11. A.Geranios, E. Fokitis, S. Maltezos, D. Koutsokosta, I. Antoniadou, O. Malandraki, A. Mastichiadis, E. Antonopoulou, V. Gika, S. Dimitrakoudis

“*Lateral Distribution Functions of Extensive Air Showers*”, Proceedings of the 30th International Cosmic Ray Conference, Vol. 4 (HE part 1), p. 539–542, Mexico City, Mexico, 2008.

12. E. Fokitis, P. Fetfatzis, S. Maltezos, V. Gika, N. Antonakakis, Spyropoulos, V.Xidi, A. Georgakopoulou, “*A Fluorescence /Air Cherenkov Telescope Prototype in Greece: Possibility to Detect Escaping Taus from Helmos Mountain in Greece*”, Proceedings of the 10th ICATPP 2007 Astroparticle, Particle and Space physics, Detectors and medical physics Applications, Vila Olmo, Como, Italy, 2007. Published at World Scientific, 2008, p. 194-198.
13. E. Fokitis, P. Fetfatzis, S. Maltezos, V. Gika, N. Antonakakis, Spyropoulos, “*Design of a Wide Spectral Range and High-Resolution Spectrograph for Monitoring the Night Sky Background for use in Air Fluorescence Telescopes*”, Proceedings of the 10th ICATPP 2007 Astroparticle, Particle and Space physics, Detectors and medical physics Applications, Vila Olmo, Como, Italy, 2007, Published at World Scientific, 2008, p. 224-228.
14. A. Geranios, E. Fokitis, S. Maltezos, D. Koutsokosta, I. Antoniadou, O. Malandraki, A. Mastichiadis, E. Antonopoulou, V. Gika, S. Dimitrakoudis “*Energy Estimation of Ultra High Energy Cosmic Rays - Vertical and Inclined Extensive Air Showers*”, 8th Hellenic Astronomical Conference, Thassos, Greece, 2007. Proceedings have not published.

CTA Collaboration Meeting Presentation:

1. E.Fokitis, S.Maltezos, A. Aravantinos, M. Kompitsas, I.Kominis, P.Fetfatzis,V.Gika, H.Koubli,G. Koutsourakis, “*Introduction to High Spectral Resolution LIDAR*”, *CTA meeting*, Zeuthen, Germany (2010).

TECHNICAL SKILLS

C/C++, ROOT, PAW, MATLAB, HTML, LaTeX, Linux, MS Office.

OTHER INFORMATION

Citizenship: Greek

Languages: Greek, English, French.