

REVIEW

by **Prof. Ivan Borisov Evstatiev, PhD** „Angel Kanchev“ University of Ruse
of submitted materials so as to participate in a competition for holding the academic position of **associated professor**
in the area of higher education: **5. Technical Sciences**,
professional trend: **5.2. Electrical Engineering, Electronics and Automation**,
scientific subject: **Electric Power Supply and Equipment (Electronic devices in power generation)**

Senior assist. prof. Hristo Todorov Ibrishimov is participating in the competition for associated professor, published in the Official Gazette, issue 68/31.07.2020 and on the website of TU-Gabrovo, for the needs of the Department of Electric Power Supply and Equipment at the Faculty of Electrical Engineering and Electronics, Technical University of Gabrovo.

1. BRIEF BACKGROUND DATA

Senior assist. prof. Hristo Todorov Ibrishimov graduated from the Technical University of Gabrovo as a bachelor in Electronics in 2007 and as a master in Electronics in 2008.

He was granted a PhD degree in July 2015 at the Technical University of Gabrovo. The scientific subject of his PhD thesis is *Industrial Electronics*. The topic of his PhD thesis is *Investigating and Modelling Inductors for Volumetric Heating with Differentiated Zones of the Electromagnetic and Thermal Field*.

PhD Ibrishimov started his career as a programmer in 2009. Later, in 2014, he became an assistant professor and in 2016 a senior assistant professor at the Technical University of Gabrovo.

He speaks fluent Russian and English.

He is a member of the Union of Scientists in Bulgaria.

2. GENERAL OVERVIEW OF THE SUBMITTED MATERIALS

Senior assist. prof. Hristo Todorov Ibrishimov has 38 publications, of which 31 have been submitted for the competition. Seven publications are directly related to his dissertation work.

To take part in the competition, he has submitted 10 publications which are refereed and indexed in world-renowned data bases, which is equal to a monography with a generalized title *Development of Methods, Modelling and Investigating of Processes and Materials*.

Except for the materials which are equal to a monography, the following publications have been submitted and reflected in the list of points for meeting the minimum requirements:

- **3** scientific publications refereed and indexed in world-renowned data bases providing scientific information;
- **18** scientific publications in non-refereed peer-reviewed journals or in edited collective volumes;
- **1** guide in *Electronic Devices in Power Generation* for laboratory practice;
- **1** guide in *Electronic Devices in Power Generation* for term papers.

3. EFFECT OF THE SCIENTIFIC PUBLICATIONS ON THE SCIENTIFIC COMMUNITY (known citations)

There is a reference of 8 citations, all of which are in scientific journals refereed and indexed in the world-renowned data base providing scientific information (SCOPUS).

4. OVERVIEW OF THE CONTENT AND RESULTS OF THE WORKS SUBMITTED

The main thematic trends in the works of PhD Ibrishimov are: *Development of a device for contactless recognition of substances, materials, mixtures and characteristics* and *Computer-assisted modelling of processes, phenomena, devices and systems*.

The publications in the first thematic trend, *Development of a device for contactless recognition of substances, materials, mixtures and characteristics*, present a development of an ultrasonic method and its application to contactless recognition of substances, materials, mixtures and physical characteristics.

According to the author, a development of a device for generating, forming, emitting and receiving an ultrasonic signal with parameters set in advance is presented [B.4.2]. Development of procedures of feature spaces in classifiers: for alcohol percentage [B.4.3], for stages of milk coagulation [Г.8.4], for recognition of the amount of dry matter in carbonated beverages [Г.8.8], for recognition of plastics [Г.8.5, Г.8.7]. An output control system for detecting the deviation in

the vacuum of packaged bulk products [Г.8.6]. Application of artificial neural network for a classifier of hardness of steel pieces [Г.8.1].

The publications in the second thematic trend, *Computer-assisted modelling of processes, phenomena, devices and systems*, present a development of models of processes, devices and systems of different purpose. Modelling is based on an abstract model where specific properties of the media which builds it are set to solve specific problems.

Models for modelling mixed problems for electromagnetic and thermal field upon induction heating have been developed [B.4.1], [B.4.5], [B.4.8] and [Г.7.1]. A method for defining the equivalent parameters of the inductor-piece system in inductors for volumetric heating connected in series has been proposed [Г.7.2]. Modernization and adaptation of systems for controlling power sources of induction heating [Г.8.2] and [Г.8.3]. Modelling of components and units of high-frequency converters [Г.8.18]. A model for contactless transmitting of energy of low capacity [B.4.9].

Models of LED lighting and secondary lenses of different purposes for street, indoor and outdoor lighting have been developed [B.4.6], [B.4.7], [Г.7.3] and [Г.8.15].

PhD Ibrishimov has publications in thematic trends of purely applied nature:

- *Investigating the photometric characteristics and colorimetric characteristics, and temperature modes of LED lighting* [B.4.4], [B.4.10] and [Г.8.13];

- *Electricity audit of existing lighting networks in the town of Gabrovo, town of Pavlikeni and urban areas in the Municipality of Pavlikeni*. The contribution of the author is related to the process of auditing and participation in the electrotechnical calculations so as to replace the existing lighting with LED lighting [Г.8.12] and [Г.8.14];

- *Development and introduction of virtual technologies for sustainable development of distance learning at the Technical University of Gabrovo – E-Learning System and Virtual Library* [Г.8.10]. The possibilities for training target groups and blended learning in the master degree course of Automotive Electronics have been studied [Г.8.9] and [Г.8.11].

I believe that the thematic areas, the content and results of the submitted works completely correspond to the scientific subject: Electric Power Supply and Equipment (Electronic devices in power generation).

5. GENERAL CHARACTERISTIC OF THE CANDIDATE'S PERFORMANCE

5.1. Teaching practice (work with undergraduate and postgraduate students)

According to the submitted documents and references, the most significant achievements of PhD Ibrishimov in the teaching area are 5 courses of lectures for a bachelor degree course whose lead lecturer is the Candidate. He delivers lectures and laboratory exercises to both full-time and part-time students. The courses are as follows:

- ***Electronics*** for a bachelor degree course of Electric Power Supply and Equipment
- ***Fundamentals of Automation*** for a bachelor degree course of Electric Power Supply and Equipment;
- ***Electronic Devices in Power Generation*** for a bachelor degree course of Electric Power Engineering and Electric Equipment;
- ***Fundamentals of Automation*** for a bachelor degree course of Electric Power Engineering and Electric Equipment;
- ***Electromagnetic Compatibility*** for a bachelor degree course of Electric Power Engineering and Electric Equipment.

He is an author of two teaching materials, 1 guide in *Electronic Devices in Power Generation* for laboratory practice and 1 guide in *Electronic Devices in Power Generation* for term papers. Both guides have been submitted for the competition.

PhD Ibrishimov has often taught more hours than those defined as his academic workload. He has also participated in the set-up of a new lab in Electronics.

Assist. Prof. Ibrishimov has taken part in the development of 3 study programs for the bachelor degree course of Electric Power Engineering and Electric Equipment. They are as follows:

- Electronic Devices in Power Generation
- Fundamentals of Automation
- Electromagnetic Compatibility

I think that the teaching practice of assist prof. Hristo Ibrishimov is impressive and completely corresponds to the necessary requirements in relation to opening a procedure for an associated professor.

5.2. SCIENTIFIC AND SCIENTIFIC-APPLIED ACTIVITIES

Taking into consideration the submitted materials, the Candidate's scientific and scientific-applied activities can be referred to the following main trends:

- development of a device for contactless recognition of substances, materials, mixtures and characteristics;
- computer-assisted modelling of processes, phenomena, devices and systems;
- development of models of LED lighting;
- electricity audit of existing lighting networks.

It should also be mentioned that the Candidate participates in scientific networks.

A great number of his publications are related to the subjects of scientific research projects, which underlines the application of the Candidate's scientific activities into practice.

The subject of his scientific and scientific-applied activity is topical. It is linked to the application of advanced methods for researching and modelling processes related to power engineering. I believe that the Candidate's scientific and scientific-applied activities correspond to the common requirements related to the procedure of an associated professor.

5.3. Implementation activities

The implementation activities cover the coordination and management of 2 university scientific research projects, participation in 2 projects under Operational Programmes and 1 national scientific research project.

The subject of the projects corresponds to the area of the Candidate's scientific publications.

I think that the implementation activities of PhD Ibrishimov completely correspond to the requirements related to the opening of a procedure for an associated professor.

6. CONTRIBUTIONS (scientific, scientific-applied, applied).

The opinion of the reviewer is that the contributions are scientific-applied and applied.

Scientific-applied contributions

Those contributions could be summarized as follows:

1. Developing a mathematical model of the process of volumetric induction heating of cylindrical pieces.
2. Synthesizing and developing models of high-frequency transformer and a system for inductive transfer of energy of low capacity.

3. A model of temperature mode of industrial lighting.

The scientific-applied contributions are linked to extending the knowledge in the area of electric power engineering.

Applied contributions

1. Design and development of ultrasonic signal devices.

2. Development of specialized applied software in LabVIEW environment.

3. Development of automated classifiers for recognizing alcohol percentage, milk coagulation, amount of dry matter in carbonated beverages, and plastics.

4. Development of a methodology for calculating the equivalent parameters of an inductor-piece system.

5. Design and investigation of LED lighting.

The applied contributions are related to the application of advanced approaches to developing devices.

I think that the scientific-applied and applied contributions are important for the development of today's theory for building and controlling electronic systems for both power generation and industry.

7. EVALUATION OF THE PERSONAL CONTRIBUTION OF THE CANDIDATE

The materials submitted for the current competition show that PhD Ibrishimov is an independent author of 5 publications and 2 guides. Two of his publications have 2 co-authors and the rest 24 publications have more than two co-authors. He is the first co-authors of 2 publications.

Eight citations are presented and all of them are in publications refereed in Scopus. The Candidate has coordinated and managed 2 scientific research and implementation projects and has participated in 3.

Taking into account the above information, I strongly believe that the personal contribution of PhD Hristo Ibrishimov is beyond any doubt.

8. CRITICAL COMMENTS AND RECOMMENDATIONS

I would like to recommend to the Candidate to take into consideration the following in his further work:

- To more actively implement his developments in practice. I think that his developments and contributions are significant for industry, in particular power generation.
- To coordinate and manage scientific research projects with broader subjects and higher budgets.

9. PERSONAL IMPRESSIONS

I know PhD Hristo Ibrishimov from scientific conferences and accreditation meetings. I have to emphasize his recognition in the scientific community, which is confirmed by 8 citations in Scopus publications.

I would also like to note that all requirements in relation to registration in NACID are met.

I think that the Candidate has excellent qualities as a scientist and expert and has the ability to further develop. If the competition is successful, the Technical University of Gabrovo will have an excellent lecturer, scientist, implementer and organizer.

10. CONCLUSIONS:

Taking into account the above mentioned, I propose senior assist. prof. Hristo Todorov Ibrishimov to be selected as an associate professor in the area of higher education: 5. Technical Sciences, professional trend: 5.2. Electrical Engineering, Electronics and Automation, scientific subject: Electric Power Supply and Equipment (Electronic devices in power generation).

15.12.2020

Reviewer: /signature/

/Prof. I. Evstatiev, PhD/