



OPINION

by Dr. Nikola Petrov Mihailov, DHC, Professor at the University of Ruse "Angel Kanchev"

of the materials submitted for participation in the competition for the academic position "Professor" of Paisii Hilendarski University of Plovdiv in the field of higher education: 5. Technical sciences, professional field: 5.2 Electrical engineering, electronics and automation (Automated Systems for Information Processing and Management)

In the competition for "professor", announced in the State Gazette, issue 40 from 14.05.2021 and on the website of Paisii Hilendarski University of Plovdiv for the needs of the Department of Electronics, Communications and Information Technologies (ECIT) at the Physico-technological faculty, as a candidate participates Assoc. Prof. Dr. Rumen Kostadinov Popov from Paisii Hilendarski of University of Plovdiv.

1. General presentation of the procedure and the candidate

The opinion was prepared according to order № P33-4298 from 10.08.2021 of Prof. Dr. Rumen Mladenov, Rector of Paisii Hilendarski University of Plovdiv and minutes of the first absentee meeting of the scientific jury on the procedure for holding an academic position "Professor" at Paisii Hilendarski University of Plovdiv in the field of higher education: 5. Technical sciences, professional field: 5.2 Electrical Engineering, Electronics and Automation (Automated Systems for Information Processing and Management), announced for the needs of the Department of ECIT at the Paisii Hilendarski University of Plovdiv.

The only candidate for participation in the announced competition has submitted documents - Assoc. Prof. Dr. Rumen Kostadinov Popov from the Department of ECIT. The presented set of materials meets all the requirements of the Law for the Development of the Academic Staff in the Republic of Bulgaria (LDASRB), the Regulations for the Implementation of the LDASRB and the Regulations for the Development of the Academic Staff of Paisii Hilendarski University of Plovdiv.

2. General characteristics of the candidate's activity

Evaluation of the educational and pedagogical activity

The teaching activity of Assoc. Prof. Dr. Rumen Popov began at the Technical University - Sofia, Plovdiv branch in 1991, continued at the European Polytechnic University - Pernik and Technical College - Smolyan. In March, 2015, the candidate held the academic position of associate professor at Paisii Hilendarski University of Plovdiv. In the mentioned higher schools he gives lectures, conducts seminars and laboratory exercises, and only in the University of Plovdiv he conducts classes in 14 disciplines for the last 5 years. His work with graduates and especially his publishing work with Bulgarian and foreign doctoral students leaves an excellent impression. He is the author of 4 textbooks, one of which is written in English. The video exercises in the discipline "Sensors and actuators" are an additional opportunity for self-preparation and improving the practical skills of students. All teaching materials are distinguished by academic writing, are well structured and understandable to learners. Assoc. Prof. Dr. Rumen Popov actively participates in the development of

numerous educational documentation. These circumstances give me reason to appreciate his educational and pedagogical activities.

Evaluation of the scientific and scientific-applied activity of the candidate

The scientific and scientific-applied activity of the candidate is oriented to the development of theoretical bases, methods and means for research of the technical parameters and characteristics of heat storage systems and of hybrid air conditioning systems. He also works in the field of virtual control and measurement systems. In the group of indicators B4 the colleague is presented with 10 publications, equivalent to a monograph. They are referenced and indexed in the world-famous databases of scientific information (Web of Science and Scopus). The publications are with Impact Factor in the range 0.229-8.001 and have over 120 citations. All articles, including those in Group D, are collective. I do not have a distribution protocol, but there is no reason to doubt the active participation of Assoc. Prof. Rumen Popov in these publications.

The analysis of the presented scientific articles and reports allows me to formulate the following scientific, scientific-applied, applied and methodological contributions:

1. Certain thermal characteristics (phase transition temperature, latent heat line, heat capacity) of composite materials with phase change of type E53, E46 and ECP and justification of the possibility of their implementation in passive and / or active heat storage systems in buildings [B4.1] (over 48 observed citations);
2. Comparative analysis between field and laboratory tests to determine the thermal characteristics of ground heat exchangers and substantiate the areas of application [B4.5] (35 observed citations);
3. Mathematical modeling and 3-D numerical simulation studies for predicting the thermal behavior of heat accumulators with paraffins [B4.2, B4.3] (6 observed citations);
4. New method for determining the efficiency of vertical ground heat exchangers and the surrounding underground thermal properties [B4.6] (5 observed citations);
5. Synthesized and developed set of virtual tools (in LabVIEW™ environment) for calculation of uncertainty in measurements of quantities and verification of statistical hypotheses during operation of a hybrid photovoltaic / thermal energy system [B4.7] (5 cited notes);
6. 3D mathematical model of a process for determining the thermal characteristics of underground thermal energy accumulators [B4.10] (3 observed citations);
7. Generalized classification of models, methods and software tools for studying the thermal behavior of shallow geothermal energy accumulators [B4.9] (3 observed citations);
8. Demonstration of the efficiency of a hybrid installation with daily and seasonal accumulators in different operating modes for the soil and meteorological conditions of the Plovdiv region [B4.8] (11 observed citations);
9. Statistical estimates for the thermal resistance of vertical ground heat exchangers and the thermal conductivity of the soil for the region of Plovdiv [B4.6, B4.8 B4.10];
10. Analytical review of heat storage systems (underground top-line accumulators and those using phase-change materials) [B4.4.] (10 observed citations);



11. Developed and tested latent heat accumulator using paraffins E53, E46 and ECP [B4.1] [B4.2, B4.3].

I also acknowledge the contributions stated by Assoc. Prof. Dr. Rumen Popov in the group of indicators G. To a certain extent, the significance of the learned contributions is assessed by the sum of indicators 12, 13, 14 and 15 of group D (citations, reviews). The 366 points achieved by the candidate many times exceed the minimum number of required points.

3. Critical remarks and recommendations

I have no critical remarks. I recommend the colleague to expand his research in the field of intelligent energy storage systems.

Conclusion

After getting acquainted with all the materials provided under the procedure and taking into account the fact that practically all indicators exceed the minimum requirements for "Professor" in the professional field 5.2 Electrical Engineering, Electronics and Automation of the Regulations for the application of the LDASRB and the Regulations for the Development of the Academic Staff of Paisii Hilendarski University of Plovdiv I give a **positive assessment and recommend the Scientific Jury to prepare a report-proposal to the Council of the Physico-technological faculty for the election of Assoc. Prof. Dr. Rumen Kostadinov Popov for the academic position "Professor" in field of higher education: Technical sciences, professional field: Electrical Engineering, Electronics and Automation (Automated Systems for Information Processing and Management) at the Paisii Hilendarski University of Plovdiv.**

23.09.2021
Ruse

Member of scientific jury:.....
/ Prof. Dr. Eng. N.P Mihailov, DHC /

