

Opinion

Prepared by Prof. DSc. Nikolay Miloshev, Corresponding Member of BAS

Concerning: Competition for the academic position of "Associate Professor" in the professional field 4.4. Earth Sciences, Department of Seismology and Earthquake Engineering, published in the State Gazette no. 86 of 15.10.2021.

The opinion is prepared on the basis of order № 01-263 of 12.11.2021 and in accordance with the requirements of Section 4 of the Regulations for implementation in NIGGG-BAS of the Development of Academic Staff in the Republic of Bulgaria Act.

Candidate for the academic position "Associate Professor" Plamena Raykova-Tsankova, PhD - Chief Assistant in the Department of Seismology and Earthquake Engineering at NIGGG-BAS.

Education and professional qualification

Plamena Raykova-Tsankova was accepted as a student at the Faculty of Physics at Sofia University in 2007. In 2011 she received a bachelor's degree in astrophysics, meteorology, and geophysics. Since 2009 she has been working at the National Institute of Geophysics, Geodesy and Geography (NIGGG) as a geophysicist. In April 2013 he received a master's degree as a geophysicist at Sofia University "St. Kliment Ohridski", Faculty of Physics with a thesis on the topic: "Aftershock activity after the earthquake of May 22, 2012." In the same year she appointed seismologist at NIGGG-BAS. In August 2013 Plamena Raykova-Tsankova began her PhD studies in: "Seismology and internal structure of the earth. In May 2017 she acquired PhD degree after defending a dissertation on the topic: Characteristics of for-aftershock and swarm type seismicity on the territory of Bulgaria and the surrounding area.

Implementation of the requirements for holding the academic position of "Associate Professor"

From the reference made for the implementation of the minimum requirements for holding the academic position "Associate Professor", defined in the regulations on the terms and conditions for obtaining degrees and for holding academic positions in BAS, respectively the requirements of Article 1A, subparagraph 2, it is established that Assistant Professor Plamena Raykova – Tsankova, PhD has 476 points of 41 publications.

Criteria for professional field 4.4. Earth sciences are performed as follows:

From indicator A – 50 points. Successfully defended dissertation on the topic: Characteristics of for-aftershock and swarm type seismicity on the territory of Bulgaria and the surrounding area;

From group of indicators B - 115 points, from 10 scientific publications in editions, which are referenced and indexed in world-famous databases with scientific information Scopus, Web of Science, ERIH +;

From group of indicators D - 221 points from 31 publications:

3 of which are in referenced and indexed in world-famous databases with scientific information;

2 - in the monographs;

and 26 publications in non-peer-reviewed,peer-reviewed journals or in edited collective volumes;

From group of indicators E - 60 points, from 15 citations:

9 citations in referenced and indexed in world-famous databases;

3 citations in monographs and collective volumes with scientific review;

3 citations in unrefereed journals with scientific review;

From a group of indicators E - 30 points, from participation in international and national scientific and educational projects.

Synthesized assessment of the main scientific and scientific - applied contributions of the candidate

Scientific activity

The contributions in the publications presented at the competition are grouped in the following main thematic areas:

1. Research and analysis of seismicity and seismogenic processes in seismic active zones on the territory of Bulgaria and the surrounding area;
2. Assessment and analysis of the space - temporal distribution of clusters (foreshocks, aftershocks, swarms) on the territory of Bulgaria and the surrounding area;
3. Spectral characteristics of different types of seismic clusters for the territory of Bulgaria;
4. Seismic hazard assessment.

Plamena Raykova-Tsankova participates in research on the space-temporal variations of regional seismicity and seismic regime, based on information from NOTSSI, as well as in the creation of a catalog of earthquakes in Bulgaria for the period 1981-2019 (works 1, 2, 9, 10, 21, 22, 28, 31).

Some of the works of the participant in the competition (publications 3, 6, 8, 17, 24, 38, 39) are related to the analysis and estimation of the space - temporal distribution of different types of clusters (foreshocks, aftershocks and swarm type of seismicity) on the territory of Bulgaria and its surroundings. The study of these clusters is very important because they are a source of information for the physical and mechanical properties of the zone and for the generation processes there.

Spectral analysis of seismic waves is a major source of information about the epicenter and the environment of propagation. Applying the Brune model, the seismic wave spectrum can be used to estimate seismic source parameters, such as: seismic moment M_0 , stress drop $\Delta\sigma$, source radius and seismic moment magnitude. The obtained results from the candidate are presented in publications: 19, 23, 33, 34, 35.

In the candidate's publications (eg publication 27) an assessment of the seismic hazard for the territory of Bulgaria was made. Plamena Raykova-Tsankova also participates in generating prognostic scenarios for the cities of Ruse, Blagoevgrad, Plovdiv and Vliko Tarnovo (works 30, 32, 40, 41), which are compared with observed seismic impacts for the respective cities. Assessing scenarios for a city is one of the most important challenges in the field of seismology. The results show that the generated scenarios are reliable and can be used in risk scenario development, engineering solutions, as well as infrastructure planning and insurance.

Scientific - applied activity

Over the years, Plamena Raykova-Tsankova has participated in 17 projects - a evidence to her active research and applied work. Most of the projects are related to the seismic hazard both on the territory of the whole country and in individual regions, related to the design and seismic protection of high-risk facilities. She also participated in the preparation of a methodology for analysis, assessment and mapping of the seismic risk of the Republic of Bulgaria. The applicant also participates in projects related to environmental protection and risk reduction of adverse events and natural disasters.

Conclusion

From the above I believe that Assistant Professor Plamena Raykova-Tsankova, PhD is an established specialist with proven qualities to occupy the academic position of "Associate Professor" in the professional field 4.4. Earth Sciences, Department of Seismology and Seismic Engineering. Its scientific and scientific-applied realization meet the requirements of the Development of Academic Staff in the Republic of Bulgaria Act (DASRBA), and the Ordinance of the Ministry of Education and Science for its application, as well as the Regulations for application of DASRBA in NIGGG-BAS.

Sofia

Opinion prepared by:

/Prof. D^{Sc}. Nikolay Miloshev,
Corresponding Member of BAS/