OPININION

in a competition for the academic position of "Associate Professor"
in professional field 4.5 Mathematics (Mathematical analysis),
published in SG No.40/14.05.2021, with a single candidate Chief Ass. Prof.
Stoil Ivanov Ivanov, PhD
from
the member of the scientific jury: Prof. Vasil Georgiev Angelov,DSc, PhD
University of Mining and Geology "St. Ivan Rilski ", Department of Mathematics
and Informatics.

ОснованиеThe basis

By the Rector order № P33-3130/12.07.2021 of the University of Plovdiv
(PU) "Paisii Hilendarski" I was appointed a member of the scientific jury of a
competition for the academic position of "Associate Professor" at PU "Paisii
Hilendarski".

1.General presentation of the procedure and the candidate

The only candidate announced in the competition is Ch. Assistant Professor Dr. Stoil
Ivanov Ivanov. The candidate has submitted all the necessary documents for the procedure,
described in the Regulations of the University of Plovdiv for the development of the academic
staff. Ch. Assistant Professor Dr. Stoil Ivanov has a PhD in Mathematical Analysis, with a
dissertation defended at the Faculty of Mathematics and Informatics at the University of Plovdiv
"Paisii Hilendarski" in 2014 on "Convergence of the iterative method of Halley for individual and
simultaneous approximation of zeros of polynomials" with a supervisor Prof. P. Proinov. From
2013 to 2015 he was an assistant in the Department of Theoretical Physics at the Faculty of
Physics at the University of Plovdiv. Since 2015 he has been a Senior assistant in the Department
of Educational Technologies at the Faculty of Physics and Technology of the University of
Plovdiv "P. Hilendarski ".

2. General characteristics of the research and scientific-applied activity of the candidate

The results obtained from the candidate Ch. Assistant Professor Dr. Stoil Ivanov
have been published in a total of 21 articles and have been cited over 80 times.
Of his works in the present procedure are included 10 titles, all published after 2014, ie.
after the defense of a doctoral dissertation and after holding the academic position of "chief
assistant". Of the works presented in the procedure, 8 are referred to in the scientific databases of
Web of Science (Clarivate) and Scopus. Of these, 7 are in editions with impact factor (IF) and 1 -
with impact rank (SJR) without IF. Two of the publications are listed as habilitation work (in the
List for fulfillment of the minimum national requirements for associate professor, indicator B4).

The citations submitted for the competition are a total of 72; 21 of them are in editions with IF and 14 - in Scopus (without IF).

I believe that the materials presented in the competition are in sufficient volume and at a good level.

3. Pedagogical training and teaching activity of the candidate

Chief ass. professor Stoil Ivanov Ivanov has sufficiently long teaching experience. He has lectures and exercises in Linear algebra and Analytuical geometry, Mathematical analysis, Probability theory and statistics, Mathematical methods in physics, Spaces and operators in physics and Applied functional analysis. There is one defended graduate, 6 scientific publications with the participation of students and 11 prepared and conducted participations of students in scientific conferences and seminars. He is a co-author (together with M. Teofilova) of a Guide for solving problems in linear algebra and analytical geometry, University Publishing House "P. Hilendarski", 2017.

4. Main scientific and scientific-applied contributions of the candidate

The scientific contributions of Ch. Assistant Professor Dr. Stoil Ivanov in the publications presented for the competition are mainly aimed at studying the convergence of iterative methods with a high order of convergence for individual and simultaneous approximation of simple and multiple zeros of polynomials. The presented researches are based on a general theory for convergence of iterative processes of Picard type in conical metric spaces and n-dimensional vector spaces, developed by Prof. P. Proinov. In particular, in paper [2] from the presented list of publications two types of theorems for local convergence of the Chebyshev iterative method for individual approximation of polynomial zeros with known multiplicities are obtained. The obtained theorems give an accurate estimate of areas of convergence of the method, as well as a priori and a posteriori estimates of the error from the first iteration.

In 1891, Weierstrass constructed the first method for the simultaneous approximation of zeros of polynomials, which has a second order of convergence. In 1964, Dochev and Burnev introduced the first simultaneous method with a third order of convergence for prime zeros, and three years later Ehrlich introduced another simultaneous method, which also has a third order of convergence for prime zeros. In the article [5] a family of iterative methods with third order of convergence is constructed, which includes as special cases the methods of K.Dochev and P.Burnev and Ehrlich. A theorem with computer-verifiable initial conditions and error estimation is obtained and it is shown that the optimal convergence region is obtained by the Ehrlich method.

In the papers [7], [8] and [9], theorems for local and semi-local convergence of a method of Sakurai, Thorium and Shugiura are proved, which have a fourth order of convergence. The obtained results summarize and improve previous results of Petkovic et al.

In the paper [10] a family of simultaneous methods of the Gander type is constructed and investigated, which has a fifth order of convergence when approximating simple zeros of polynomials. Theorems for local and semi-local convergence with a priori and a posteriori error estimates from the first iteration have been proved.

In 2002, Batra considered Newton's classical iterative method as a method in n-dimensional vector space. In [1], the Halley method is considered as a method for simultaneous approximation of prime zeros of polynomials and theorems for local and semi-local convergence with error estimates are obtained. As a continuation of this work, the convergence of the methods of Newton, Halley, Chebyshev and Schroeder, considered as methods for simultaneous approximation of zeros of polynomials with known and unknown multiplicities, was studied in [3], [4] and [6].

In my opinion, the research and scientific-applied activity of Ch. Assistant Professor Dr. Stoil Ivanov fully correspond to the professional field and the scientific specialty of the competition. I do not find plagiarism in the submitted publications of the candidate.

5. Critical remarks and recommendations

As a remark I can point out that in the self-assessment of the contributions, the candidate has formulated them in more points than necessary.

CONCLUSION

Based on the submitted documents on the procedure, contributions to the scientific papers and scientometric indicators of Dr. Stoil Ivanov, I believe that in qualitative and quantitative terms they meet both the minimum national requirements of ZRASRB and the Rules of ZRASRB in the professional field of the competition and additional FMI requirements of PU. This gives me reason to give **a positive assessment** to the candidate and to propose Ch. Assistant Professor Dr. Stoil Ivanov Ivanov to take the academic position of "Associate Professor" in the professional field 4.5 Mathematics (Mathematical Analysis), for the needs of PU "Paisii Hilendarski".

18.08.2021 г.   **Member of the Scientific Jury:**
                                                            /Prof. Vasil Georgiev Angelov, DSc