

OPINION

By Assoc. Prof. DSc. Boris Ivanov Evstatiev,

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On a dissertation thesis for obtaining the educational and scientific degree “**Doctor**” in professional field 5.3 “Communication and computer engineering”, scientific specialty “Communication Networks and Systems”.

Author of the dissertation: **mag. eng. Seyhan Sadak Myumyunali.**

Topic of the dissertation: **Research and improvement of the quality of service in satellite communication channels.**

1. General description of the dissertation and the materials attached to it

The presented dissertation includes a notations list, an introduction, an exposition in five chapters, a conclusion, contributions, a list of publications and a list of references, in a total volume of 129 pages.

2. Relevance of the problem

The topic of the dissertation thesis is related to the study of various aspects of satellite distribution of digital television signals. The influence of various factors on generation, coding and modulation of DVB-S/S2 signals is considered based on simulation models. Experimental measurement of various quality parameters of transponders has been carried out. Simulation studies of the satellite-Earth communication channel and the performance of satellite communication system models have also been conducted. Considering the modern development of information and communication technologies and the increasingly intensive penetration of digitization, the transmission and processing of data by means of satellite communication is particularly relevant.

3. Degree of knowledge of the state of the problem

The PhD student shows a very good knowledge in the field of communication based on artificial satellites and various digital television standards. The literature review includes 159 sources, out of which 124 in Latin, 13 in Cyrillic and 22 websites.

4. Approach and solution to the problem

The methodology of the dissertation thesis follows a logical sequence, examining different aspects of satellite digital television, at different hierarchical levels of its organization: analysis of basic concepts related to the application of satellite communications and the basic standards for digital television; developing a DVB-S2 standard model and conducting simulation studies; conducting experimental studies with the aim of studying some parameters and characteristics when using satellite digital television; experimental studies of basic parameters and factors affecting the communication channel "artificial satellite - earth"; modeling of some aspects of modulation in satellite communication systems for data transmission. Different tools of the study were used, such as the specialized training system EnduroSat, a spectrum analyzer, MATLAB/Simulink, etc.

5. Main contributions

The contributions of the dissertation can be classified as scientific-applied and applied. The scientific-applied contributions include: the developed model for the simulation of a digital television system according to the DVB-S2 standard; the synthesized satellite communication channel model; the developed model of the performance of a satellite communication system.

The applied contributions include: the investigated and established dependences on various signal parameters using the developed model of DVB-S2; the obtained estimates and the performed comparative analysis of the parameters of the

transponders; the performed comparative analysis for different parameters of a communication channel with an artificial satellite.

The specified above contributions are significant for the science and technology and can be categorized into the following groups: enrichment, specification and refinement of existing scientific knowledge; application of existing methods to solve a specific problem; creating new research methods.

6. Publications on the topic of the dissertation and personal contribution of the author

There are 6 publications on the dissertation work at the UNITECH and TechCo national scientific conferences. In one of them the PhD student is the only author and in two others - the first author. I do not know the PhD student personally, but from what has been said so far, I believe that the results obtained in the dissertation work are his personal contribution.

7. Critical notes and recommendations on the dissertation

I have the following critical comments, recommendations and questions regarding the dissertation work:

1. I recommend to refrain from mass citation of references, such as "[7-17]". The contribution of each source should be explicitly explained.
2. The defined Goal and Tasks of the dissertation work (at the end of the First Chapter) should be identified in a separate section.
2. The quality of fig. 2.1 should be improved. Currently all texts are blurred.
3. In Chapter 3, it is good to have a "Research Methodology" section before the research itself. The same goes for Chapter 4.
4. In the academic field it is not accepted to use expressions such as "Now that we have seen how to calculate the power of ...", "...consider a sound source...";

5. I believe that sections "4.2.2.1. UHF modules", "4.2.2.2. Module FSPL – satellite communication channel simulator" and "4.2.2.4. Graphical user interface" can be shortened by removing the texts from the "User manual" of the equipment used. It is enough to write what equipment is used, what capabilities it provides and how it is set up or what settings are used. Section "4.2.2.5. Safety measures" should be completely removed.

6. The general conclusions of the thesis could be expanded and structured better. They should indicate and summarize the main results of each of the chapters.

7. I recommend the PhD student in the future to direct his publication activity to editions indexed in Scopus. This would increase the visibility of scientific results.

8. In Bulgaria, it is accepted to first list the Cyrillic references and after them the Latin ones.

9. The dissertation needs a proofreading to remove the numerous grammatical, punctuation and stylistic errors.

8. Conclusion

The critical remarks and recommendations made do not decrease the contribution of the author. The formulated notes and recommendations aim to improve the future work of the PhD student Seyhan Sadak Myumyunali.

The presented dissertation meets all requirements of the Law for the development of the academic staff in the Republic of Bulgaria and the Regulations for its implementation. **I give a positive assessment of the dissertation and suggest mag. eng. Seyhan Sadak Myumyunali to be awarded the educational and scientific degree "Doctor" in the scientific specialty "Communication Networks and Systems", professional field 5.3. "Communication and computer engineering", field of higher education 5. "Technical sciences".**

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Member of the scientific jury:/signature/.....

/Assoc. Prof. DSc. B. Evstatiev/