I. IDENTIFICATION DATA

<table>
<thead>
<tr>
<th>Thesis name:</th>
<th>HPC technologies for simulation of diffraction of electromagnetic waves by spherical obstacles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author’s name:</td>
<td>Anastasiia Puzankova</td>
</tr>
<tr>
<td>Type of thesis:</td>
<td>master</td>
</tr>
<tr>
<td>Faculty/Institute:</td>
<td>Faculty of Electrical Engineering (FEE)</td>
</tr>
<tr>
<td>Department:</td>
<td>Department of Computer Science</td>
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<tr>
<td>Thesis reviewer:</td>
<td>Associate professor Tumakov Dmitrii Nikolaevich, Ph.D</td>
</tr>
<tr>
<td>Reviewer’s department:</td>
<td>Kazan Federal University, Institute of Computer Mathematics and Information Technologies, Department of Applied Mathematics</td>
</tr>
</tbody>
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II. EVALUATION OF INDIVIDUAL CRITERIA

**Assignment**  
*Evaluation of thesis difficulty of assignment.*

The thesis deals with the problem of diffraction of electromagnetic waves. This task is classic problem and was widely investigated. A relatively new approach to the problem is used in this work. In our days, mathematical modeling is an actual topic. The above points to the actuality of the task.

**Satisfaction of assignment**  
*Assess that handed thesis meets assignment. Present points of assignment that fell short or were extended. Try to assess importance, impact or cause of each shortcoming.*

The author explores the problem of diffraction of electromagnetic waves using HPC technologies. In this work was considered and implemented the model of the waves diffraction. The author considered two cases of a diffraction. A program which is implemented considered model was also developed. The proposed solution of the modeling was parallelized using the MPI and OpenMP technologies, obtained results discussed. The thesis as a whole is performed at a satisfying level, some aspects are not properly discussed.

**Method of conception**  
*Assess that student has chosen correct approach or solution methods.*

The existing approaches to solving the problem were analyzed. A mathematical method for the proposed model is comprehensively described and correct.

**Technical level**  
*Assess level of thesis specialty, use of knowledge gained by study and by expert literature, use of sources and data gained by experience.*

The author has conducted a study of existing methods and technologies. The author accomplished the work in which demonstrated mathematical skills however this work doesn't fully demonstrate software engineering skills.

**Formal and language level, scope of thesis**  
*Assess correctness of usage of formal notation. Assess typographical and language arrangement of thesis.*

The dissertation is well designed and organized. Theoretical part of the dissertation is written clearly. The text contains a minor typos and mistakes.

**Selection of sources, citation correctness**  
*Present your opinion to student’s activity when obtaining and using study materials for thesis creation. Characterize selection of sources. Assess that student used all relevant sources. Verify that all used elements are correctly distinguished from own results and thoughts. Assess that citation ethics has not been breached and that all bibliographic citations are complete and in accordance with citation convention and standards.*

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1/2
The sources are selected and quoted correctly. Not only articles but also textbooks on physics were used to explain the work, which is very good for this work. Were used both recent and classic works, however, some of the sources are questionable regarding reliability.

Additional commentary and evaluation
Present your opinion to achieved primary goals of thesis, e.g. level of theoretical results, level and functionality of technical or software conception, publication performance, experimental dexterity etc.

Judging by results, the basic task was completely solved, but not expanded to complex cases. The testing of algorithms had shown the correctness of a mathematical model. The performance evaluation of the proposed solution showed not significant results.

III. OVERALL EVALUATION, QUESTIONS FOR DEFENSE, CLASSIFICATION SUGGESTION
Summarize thesis aspects that swayed your final evaluation. Please present apt questions which student should answer during defense.

The thesis, in its content, corresponds to the chosen topic and tasks. However, some questions are remained open:
1. Why the problem was not considered on more complex spherical objects?
2. Were there other more sophisticated experiments?

I evaluate handed thesis with classification grade C - good.

Date: 25.8.2020

Signature: