Skoltech
Skolkovo Institute of Science and Technology

# Jury Member Report – Doctor of Philosophy thesis.

**Name of Candidate:** Stepan Romanov

**PhD Program:** Physics

**Title of Thesis:** Single-walled carbon nanotubes as a source of ultrasound

**Supervisor:** Professor Albert Nasibulin

**Name of the Reviewer: Nikolay A. Gippius**

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|---|---|
| I confirm the absence of any conflict of interest<br><br>(Alternatively, Reviewer can formulate a possible conflict) | **Signature:**<br>  <br>**Date: 23-09-2020** |

*The purpose of this report is to obtain an independent review from the members of PhD defense Jury before the thesis defense. The members of PhD defense Jury are asked to submit signed copy of the report at least 30 days prior the thesis defense. The Reviewers are asked to bring a copy of the completed report to the thesis defense and to discuss the contents of each report with each other before the thesis defense.*

*If the reviewers have any queries about the thesis which they wish to raise in advance, please contact the Chair of the Jury.*

**Reviewer's Report**

Reviewers report should contain the following items:

- Brief evaluation of the thesis quality and overall structure of the dissertation.
- The relevance of the topic of dissertation work to its actual content
- The relevance of the methods used in the dissertation
- The scientific significance of the results obtained and their compliance with the international level and current state of the art
- The relevance of the obtained results to applications (if applicable)
- The quality of publications

The summary of issues to be addressed before/during the thesis defense

The thesis is a solid work on the application of SWCNT in the very important domain of thermophones. The thesis includes the introduction and four chapters. The introduction chapters provides the review of this field along with the description of the key experimental methods of the research. Second chapter describes the thermoacoustic effect and thermophones. The last chapter consists of five sections representing the main results obtained in by the author.

The title of the thesis is coherent with the content of the thesis and its structure. The methods used in the thesis are well presented in Chapter 2 and allow good understanding of the basics of all the experimental measurement techniques used.

The obtained results are important from both scientific and practical points of view as they from a good basis for further progress in the application of SWCNT in thermoacoustic. I appreciate discussion of different thermal loss of the SWCNT films in different environments. These results are of clear practical importance.

The publications included in the thesis are of high quality and are visible on the international level.

I have a minor question concerning the Fig.1.8-2:

What parameters control the average temperature, does it saturates at some level or grows slowly with time? How does the heating depend on the emitted power and geometry of the thermophone?

**Provisional Recommendation**

☒ *I recommend that the candidate should defend the thesis by means of a formal thesis defense*

☐ *I recommend that the candidate should defend the thesis by means of a formal thesis defense only after appropriate changes would be introduced in candidate's thesis according to the recommendations of the present report*

☐ *The thesis is not acceptable and I recommend that the candidate be exempt from the formal thesis defense*