

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: Esko I. Kauppinen

<p>I confirm the absence of any conflict of interest</p> <p>(Alternatively, Reviewer can formulate a possible conflict)</p>	<p>Signature:</p>  <p>Date: 10-09-2020</p>
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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 was pleasure to read, being of high quality with logical structure. The topic is relevant regarding the single walled carbon nanotube (SWNT) novel applications as the source of ultrasound. Freestanding SWNT networks were produced, purified with vacuum heating and characterized in detail in this work, and successfully utilized to produce highly efficient ultrasound sources. Theoretical background of sound formation when heating the SWNT film with electrical current was elaborated, and experimental results were compared theoretical predictions with good agreement. Methods to further increase the sound pressure beyond the current state-of-the-art by modifying the SWNT films were developed. These results are relevant when developing practical SWNT thin film applications for the ultrasound-based technologies. The results of this thesis have been published successfully in peer-reviewed international journals.

The abstract should be revised, in order to be more exact and scientific. It should accurately tell the main results and not use terms like huge, simple, resource efficient etc. non-scientific and not accurate terms, which can be understood in many ways. The first chapter does not tell reader anything more than what the thesis tittle already tells and could be removed.

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