Jury Member Report – Doctor of Philosophy thesis.

Name of Candidate: Javier Antonio Ramirez Benavides

PhD Program: Materials Science and Engineering

Title of Thesis: Advanced single-walled carbon nanotube membranes for optoelectromechanical applications

Supervisor: Professor Albert Nasibulin

Co-supervisor: Assistant Professor Dmitry Krasnikov

Name of the Reviewer:

I confirm the absence of any conflict of interest	**Date: 07-11-2024**

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

The PhD thesis has a conventional structure containing 4 Chapters. The Chapter 1 is the literature review. It describes the state of the art in the research direction based on analysis more than 121 papers published in peer review journals.
Author formulated conlusions in the end of review part of PhD thesis. It helps to reader for better understanding of the content of PhD thesis. Chapter 2 presents an experimental methods. There are description of sample synthesis as well as methods for study of optical and electrical properties. Chapter 3 is related to the results and discussions, where the main results have been presented and analysed. Chapter 4 contains the conclusions as well as the

author’s vision of future research. The bibliography list consists of 135 references. The quality of writing and print design is very high. Obtained results can take into account during an elaboration of new optoelectronic devices. The filed RF patent demonstrates the applied character of obtained results.
The main results of PhD thesis have been already published in the international journals with a high impact factor (IF) named Applied Physics Letters (IF= 3.5) and Carbon (IF=10.5). APL is NI Journal. Also, one of the manuscripts in under revision now. This manuscript has been already submitted to Carbon (IF= 10.5).

The text of PhD thesis is solid and is presented in a cohesive way. However, I have few technical comments and questions to be addressed to the author for improve the quality of this PhD thesis:

1. Page 34, Figure 7 (SEM images), Page 35 (SEM image), Figure 8. Please add info about size of the scale bars to the figure captures .
2. Page 71, Figure 27. Why do you have 3 curves (black, blue, and red) in the insert? Black means pristine. Red means ethylene. What does mean a blue curve?
3. Page 71, Figure 27, page 85 Figure 37. I recommend to evaluate the carbon nanotube diameter based on analysis of RBM peaks.
4. Page 100, The unit of pressure is Pa instead of pa, please use kPa instead of Kpa.

Provisional Recommendation

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