

## SHORT TERM SCIENTIFIC MISSION (STSM) SCIENTIFIC REPORT

This report is submitted for approval by the STSM applicant to the STSM coordinator

**Action number: CA15127, "Resilient communication services protecting end-user applications from disaster-based failures" (RECODIS).**

**STSM title: Measures and Models to evaluate Vulnerability of Wireless Networks to Weather-based disruptions.**

**STSM start and end date: 24/10/2018 to 08/11/2018.**

**Grantee name: Antons Patlins**

### PURPOSE OF THE STSM:

(max.200 words)

After the meeting in Ohrid it is clear, that one of the significant topic currently not explicitly covered by the book structure is: „Measures and Models to evaluate Vulnerability of Wireless Networks to Weather-based disruptions“. As it was mentioned by Jacek Rak during MC meeting in Ohrid – it would be good to begin to write this significant topic. So, the main aim of my STSM is - collecting the information for providing the research about: "Measures and Models to evaluate Vulnerability of Wireless Networks to Weather-based disruptions" based on worlds literature, scientific publications, own experience, experience obtained by Kaunas University of Technology and international experts.

Also I hope that this visit will give me the experience of collaboration with researches of different cultures and will expand my network of colleagues with similar area of interest and at the same time also to encourage me for more intensive collaboration with foreign colleagues.

This STSM is also a good possibility for me – for young researcher, 6 years ago defended my PhD thesis, to enrich my experience in international level.

### DESCRIPTION OF WORK CARRIED OUT DURING THE STSMS

(max.500 words)

Following Steps (activities) has been carried out during my STSM:

- Taking into account, that one of the significant topic currently not explicitly covered by the book structure is: „Measures and Models to evaluate Vulnerability of Wireless Networks to Weather-based disruptions“, main activity was – study and collecting of materials, which, hopefully, can help in writing of this chapter.

-The expirience, targets and research area of Faculty of Mechanical Engineering and Design, Kaunas University of Technology has been studied;

-Defined theme has been discussed with experts and colleagues from Kaunas University of Technology;

-Results of my STSM has been discussed with international experts for making conclusions based on own opinion and suggestions from experts.

-An adequate list of references for topic: "Measures and Models to evaluate Vulnerability of Wireless Networks to Weather-based disruptions" has been collected.

-A scientific report about STMS results for the host institution and MC Chair (or the STSM coordinator) has been prepared. I hope that scientific report of my STSM could be a good material for all the CA COST Action CA15127 "Resilient communication services protecting end-user applications from disaster based failures" (RECODIS) - it is selected information with good list of adequate references. I hope that it is good

material and it can help to write at least a part of the chapter of final book, or can give a good ideas for it.

#### **DESCRIPTION OF THE MAIN RESULTS OBTAINED**

There are a lot of scientific papers and other references have been reviewed and discussed during current STSM. The report (prepared for STSM coordinator and approved by HOST) consist from some selected papers from reviewed list. These papers can be interesting and usefull for all the Action CA15127 "Resilient communication services protecting end-user applications from disaster based failures" (RECODIS). There are selected papers with good list of adequate references. STSM report is structured in 5 main chapters. Each chapter has own references, as well as, all the references have been listed at the end of STSM report. I hope that it is good material and it can help to write at least a part of the chapter of final book, or can give a good ideas for it.

Preface give a short information about cell signals in real world conditions – it is simply described – how weather affects cell signals (rain, fog and clouds, snow, hail, lightning, wind, bodies of water, trees and physical obstruction).

CHAPTER 1 deals with information about the effects of weather on the life time of wireless sensor networks using FSO/RF communication.

CHAPTER 2 is about high performance wireless networking and weather.

CHAPTER 3 shows how to evaluate the impact of weather condition on MANET routing protocols.

CHAPTER 4 shows factors affecting wireless signal propagation and their recommended.

Prediction and System of Alarming about Weather-based disasters can be also significant step in evaluation of Vulnerability of Wireless Networks to Weather-based disruptions. The CHAPTER 5 deals with some ideas about it. It is offered here to read the article about „A Wireless Sensor Network for Weather and Disaster Alarm Systems”.

A Full List of references used inside all the chapters of STSM report has also been given at teh end of STSM report. Current list of references consist from 85 references. 6 main references of STSM report also has been given.

#### **FUTURE COLLABORATIONS (if applicable)**

Discussions about possible further cooperation between Riga Technical University and Kaunas University of Technology has also been performed.

Hopefully, possible further cooperation with colleagues from COST Action CA15127 "Resilient communication services protecting end-user applications from disaster based failures" (RECODIS) will bring very best experience.