

## Secondment Report Form

<b>Seconded</b>	Ing. Milan Polívka, Ph.D.
<b>Host Organization</b>	<b>Id:</b>
	Name: RF&Microwave Research Lab, Ilmenau University of Technology
<b>Research Topic(s)</b>	A13 Multiband, wideband, UWB antennas

### ACTIVITIES DURING THE SECONDMENT

*<Brief description of the main activities developed during the stay, and how they contributed to achieve your work plan goals (max. 3 pages)>*

1. Conceptual framework for modified Wheeler-cap technique for evaluation of the radiation efficiency of ultra-wideband horn antennas radiating into high-permittivity media: signal flow chart and resulting equation of the experimental set-up, compensation for material and geometrically-based (phase error) losses, influence of the reflections at the horn-medium interface
2. Implementation of computer codes based on the above mentioned technique: implementation of circle data fitting (different frequency step as parameter), material and geometrical-based loss compensation
3. Conduction and analysis of measurements with existing UWB double ridge antennas: preparation of measurement tools - wheeler cap, VNA and TDR measurement for evaluation of antenna impedance parameters in TD and FD
4. Preparatory work for joint publication(s): evaluation of preliminary measurement data, mathematical apparatus and graphical pictures and schemes for intended common publication.

The one month period has been found to be short time for complex implementation, and application of the intended methodology, and evaluation and interpretation of the acquired data. We have identified several subtask/subproblems that require further deeper investigation and affect the reliability and precision of the achieved data. Among them there are:

- (i) evaluation of horn-medium interface reflect coefficient from TDR measurement
- (ii) derivation of geometrical-based loss term for compensation of losses due to the spherical to plane wave transformation between horn aperture and Wheeler cap which may
- (iii) affect the final shape of the Wheeler cap (rectangular, spherical, ..)
- (iv) evaluation of resonances in horn-Wheeler cap arrangement resulting in deep minima/maxima of the efficiency curve vs. frequency
- (v) improvement of circle fitting procedure (the choice of a proper relative frequency interval)
- (vi) validation of measurement data with the simulation results, validation of the proposed method with the horn designed to operate in the air

Thus additional works are still to be performed to achieve reliable radiation efficiency data.

## MAIN RESULTS OF THE STAY

< List of the publications co-written (or in progress)>

Other(s):

Number of Publications: \_\_\_\_\_ (1)\_\_\_\_\_

Number of Documents/ Reports: \_\_1\_\_ (2)\_Technical report\_\_\_\_\_

Number of Case Studies & Demonstrators: \_\_1\_\_ (3)\_Rectangular Wheeler cap\_\_\_\_\_

\* Attach all relevant documentation that specifies your results

## FORECAST ACTIVITIES

<Are there any envisaged activities following this secondment project, new collaborations, co directed PhD, etc>

1. Seconded Dr. M. Polivka is now with distant collaboration with doctoral student Francesco Scotto di Clemente working on the topic at host organization.
2. We have identified partial subtopics and preparing tasks for student projects now.
3. We consider another short mission in the near future. Grant resources are necessary.

In order to improve CARE's secondment program, please fill this short questionnaire. Use the space at the end to expand your answers, if needed. Our aim is to improve the general experience for secondees in future.

**Disagree**    **Agree**

### GENERAL

My objectives were achieved.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input checked="" type="checkbox"/>
The research topics were relevant to my work.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input checked="" type="checkbox"/>
I benefited from being part of a wider research culture.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input checked="" type="checkbox"/>

### HOST ORGANIZATION

I am satisfied with the quality and quantity of supervision I received.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input checked="" type="checkbox"/>
I had access to adequate resources to support my research.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input checked="" type="checkbox"/>

## SECONDMENT PROGRAM

I would recommend this secondment programme to others.  
I believe the skills I have learned will help me to improve my job/research.

1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input checked="" type="checkbox"/>
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1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input checked="" type="checkbox"/>
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I would apply to another programme similar to CARE.

1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input checked="" type="checkbox"/>
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In general, how would you classify the CARE Secondment Programme?

1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input checked="" type="checkbox"/>
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Other questions/comments to be potentially considered:

MS Word templates for required CARE forms would be fine for easier reporting.

## SIGNATURES

**Candidate** Ing. Milan Polívka, Ph.D.

**Date:** 2011/12/28  
(year/month/day)



**Signature** \_\_\_\_\_