

## **Career Development Plan-Year 1&2 (SPECIM)** *(Draft)*

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Date: 1<sup>st</sup> period (04/02/2008 – 31/01/2010) – SPECIM, Finland

### **BRIEF OVERVIEW OF RESEARCH PROJECT AND MAJOR ACCOMPLISHMENTS EXPECTED (half page should be sufficient):**

Airborne imaging spectrometers successfully contribute to the retrieval of environmental variables. Current main challenges in simultaneous retrieval of multiple variables are related to the sensor measurement quality, which is influenced by the atmosphere, soil and vegetation contributing to the final signal and technical quality of a sensor itself.

The major objectives of the proposed work for the first period are:

1. To understand and quantify the effects influencing the quality of the signal from the FODIS downwelling irradiance sensor.
2. Exploit current atmosphere-vegetation-soil radiative transfer models and explore how the FODIS data can contribute to the better estimation of top-of-canopy surface reflectance.

For this project, the VNIR airborne hyperspectral sensor AISA Eagle will be used together with the FODIS instrument, a complementary tool to the AISA sensor, recording the downwelling irradiance at the sensor level. First, outdoor ground-based experiments will be carried out to evaluate the quality and reliability of the FODIS data. It is expected to participate one or maximum two flight/field campaigns. The field data will be used for parameterization of radiative transfer modeling and validation of multiple retrievals of vegetation bio-chemical/physical variables. The remote sensing data will be used to study applicability of the FOIDS to contribute current algorithms to remove atmospheric effects from hyperspectral remote sensing data. The current physically based combined radiative transfer models of atmosphere, vegetation and soil will be used in this study. The radiative transfer modeling will be exploited to assess contribution of the main components to the sensor signal and to improve current retrieval schemes of multiple vegetation ecosystem variables from an airborne imaging spectroscopy data.

## **LONG-TERM CAREER OBJECTIVES (over 5 years):**

1. Goals:
  - To successfully finish PhD at Wageningen University
2. What further research activity or other training is needed to attain these goals?
  - PhD level courses dedicated to the research topic
  - Field and airborne data collection and relevant laboratory/outdoor experiments.

## **SHORT-TERM OBJECTIVES (1-2 years):**

### **1. Research results**

- Anticipated publications:
  - A review paper about soil-vegetation-atmosphere phenomena effecting the final sensor signal (part of the PhD proposal)
  - A manuscript summarizing the possibility of the FODIS instrument to participate on atmospheric effect removal from the hyperspectral airborne remote sensing data (2nd year of the project)
- Anticipated conference, workshop attendance, courses, and /or seminar presentations:
  - 2nd Workshop of PHYSENSE (Nordic network on physically based remote sensing of forest), 3-4 June 2008, Helsinki, Finland
  - 2nd Hyper-I-Net summer school, 15-19 September 2008, Wageningen, The Netherlands
  - 6th EARSel SIG IS Workshop Imaging Spectroscopy: Innovative tool for scientific and commercial environmental applications, 16-19 March 2009, Tel-Aviv, Israel

### **2. Research Skills and techniques:**

- Training in specific new areas, or technical expertise etc:
  - IDL programming course, 18-22 February 2008, Wageningen University, The Netherlands.
  - Hyper-I-Net e-learning courses.
  - Training in calibration and operation of an hyperspectral airborne sensor (AISA Eagle)

### **3. Research management:**

- Fellowship or other funding applications planned (indicate name of award if known; include fellowships with entire funding periods, grants written/applied for/received, professional society presentation awards or travel awards, etc.)
  - No other funding but the Marie Curie fellowship is planned.

### **4. Communication skills:**

- Scientific Writing course organized by Wageningen University (Planned for 2009)

**5. Other professional training (course work, teaching activity):**

- At the moment no other activities are planned for the 1<sup>st</sup> period.

**6. Anticipated networking opportunities:**

- Short visits to other research institutions within the Hyper-I-Net network (mainly University of Zurich and Wageningen University).

**7. Other activities (community, etc) with professional relevance:**

- At the moment no other activities are planned for the 1<sup>st</sup> period.

Date & Signature of fellow:  
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