The role of protocols and standards in hyperspectral data acquisition

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Introduction

• INTA will coordinate HYRESSA-AM8 task entitled “Review and refinement protocols” (main participants are VITO, DLR, WU, ISBE-ASCR)

• Objective: To review and report on existing protocols and refinement of them in compliance with standards in the field of airborne remote sensing techniques.

• The speaker is in charge of Data Acquisition Airborne Team at INTA and co-representative at HYRESSA programme.
Introduction

PROTOCOL

• Concept of protocol:
  – “Set of guidelines for use in various circumstances” and in particular, in Natural Sciences, protocol is “a predefined procedural method in the design and implementation of experiments” (Wikipedia)
  – “A detailed plan of a scientific or medical experiment, treatment, or procedure” (Merriam Webster’s Dictionary)

• Protocols to be reviewed will be those dealing with hyperspectral data gathering operations, calibration, validation, distribution and archiving techniques.

User requirements

• Related outputs from SWOT\(^1\) workshop (AM5):
  – Platform: an overview of available instrumentation and planned campaigns in Europe is demanded.
  – Lack of agreed standards, mainly in the calibration, processing and validation stages.
  – Demand of information of the methodology to calibrate and maintain the sensors.
  – Need of evaluating the product accuracy.

GENERAL DEMAND OF STANDARDS & TRANSPARENCY

Conclusions of QUN\(^2\) (AM6) and Exploratory meeting have emphasized this “perception”, in particular QUN results have already provided hints to the operators of which information is missing and demanded

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\(^1\) SWOT Strength-Weakness-Opportunity-Threats
\(^2\) QUN Questionnaire on Users Needs
User requirements

Phases of a hyperspectral project to consider

1. Calibration
2. Flight campaign planning
3. Flight campaign
4. Data processing
5. Distribution
6. Archiving

Methodology

The methodology proposed in the “Description of Work” HYRESSA doc seems reasonable, feasible and, hopefully, effective.

**STEP 1**: SWOT + QUN, to get a picture of where we are and where the users want us to go.
**STEP 2.1**: Identification and reviewing of existing protocols (carried out by an experienced operator)
**STEP 2.2**: Identification of existing applicable standards (carried out by an experienced end-user)
**STEP 3**: Refinement of existing protocols (coordinated by a different operator but with the collaboration of other operators and users)

It is due to start on 2007.07.01 (Month 18)
Developments

What is happening around?

GEOSS, INSPIRE, driven by policy makers
EUFAR, driven by infrastructure owners/operators
ARGOS, AERONET, NEON infrastructures user-driven
ESA, MODIS, data providers initiatives
HyperTeach, HYPER-I-NET, education initiatives

Can give some ideas but not fully applicable to the European Airborne Hyperspectral Community needs

HYRESSA has the opportunity to be the reference

Benefits

- It gives consistency to the data and allows comparison,
- It improves the efficiency of the use of the available facilities,
- It contributes to transparency and “good practices”;
- It gives the guidelines for future developments (APEX, ARES, ENMAP, etc),
- It makes easier and more attractive the access to new potential users,
- It (can) reinforces the position of the hyperspectral community in front of funding institutions,
- It makes feasible “Trans-National Access”-TNA (or at least, “Trans-Institution Access”) and the set up of a geographic distributed facility,
- Positive contribution to other “on the air” concepts: harmonization, integration, interoperability, etc…
Discussion Points

- Which activities/procedures should be “protocolized” and with what priority: Campaign management, sensor characterization, sensor calibration, data process, data quality, data validation, etc
- What information the users need and the operators can and want to provide
- Effort-Cost assessment
- Risk: loss of freedom (operator)-flexibility (all the actors)
- Will protocols reduce the costs of access to the infrastructures?
- Top-down approach,
- Opportunity factor of HYRESSA should be considered at this early stage,
- Etc..

Thank you