Selected Results Obtained with DLR's Airborne EnMAP Demonstrator

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Optical Airborne Remote Sensing (OpAiRS)

Collaboration across departments of the DLR Earth Observation Center in Oberpfaffenhofen

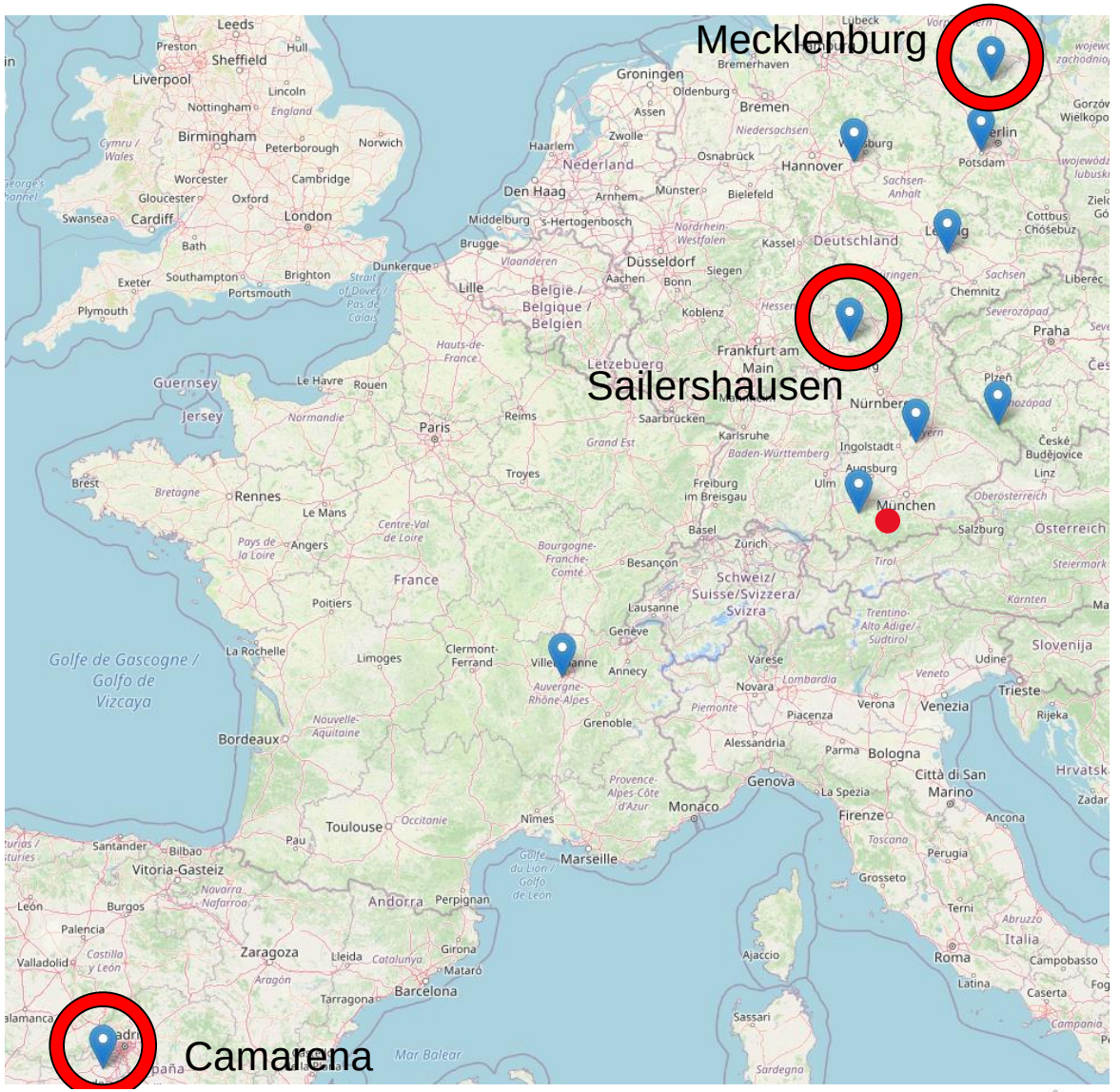
ISO 9001 certified user service since 2007

We acquire airborne imaging spectroscopy data to support DLR scientists and their associates in

- developing novel remote sensing applications
- preparing upcoming satellite missions
- validating data of spaceborne imaging spectrometers

Strong focus on data quality, instrument characterisation & calibration

We perform usually 1-2 campaigns per year with 5-10 surveys per campaign



OpAiRS HySpex Surveys in 2020

Sensors and Calibration Facilities

DLR EnMAP Simulator since 2012: HySpex VNIR-1600 + SWIR-320m-e on DLR Cessna Grand Caravan and Dornier 228

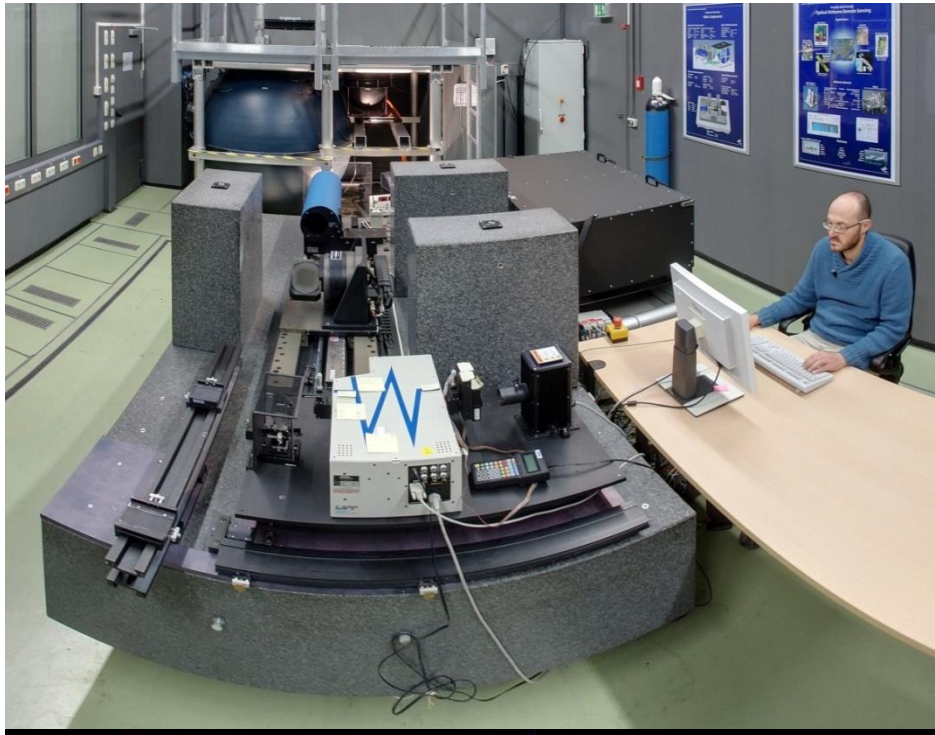
HySpex VNIR-3000N & SWIR-384 currently in commissioning phase

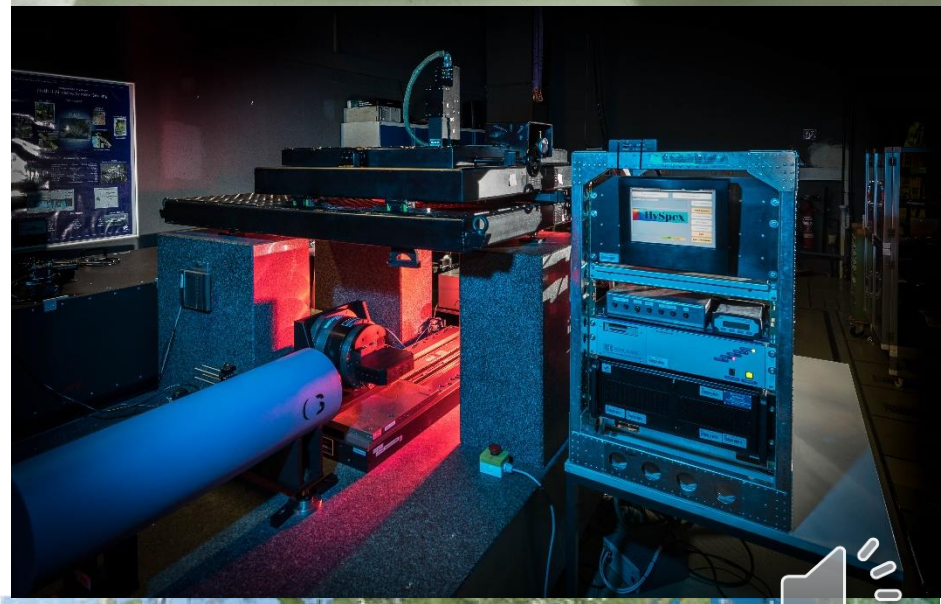
Calibration Laboratory partly funded by ESA as Calibration Home Base (CHB) for ESA's Airborne PRISM Experiment (APEX)

Current setups for geometric, spectral & radiometric characterisation including linearity, stray light & temperature dependence

Traceable to national standards (PTB, NIST)

Used for the development of improved Level 1 products (measurement techniques & algorithms)



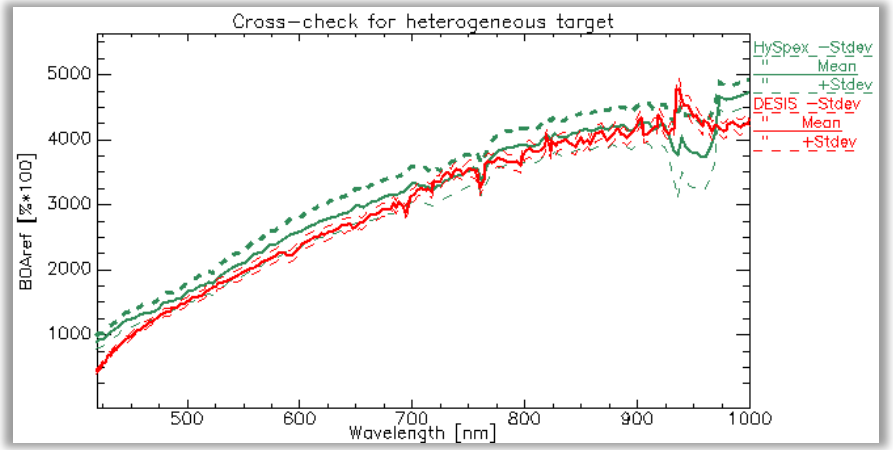


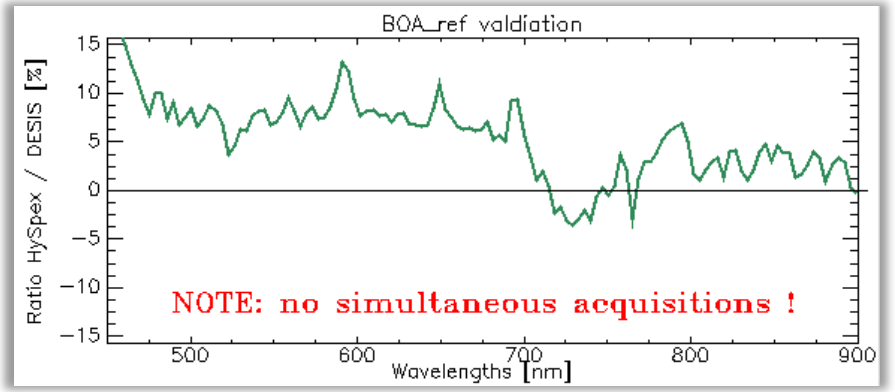
Baumgartner, Andreas and Köhler, Claas H. (2020)
Transformation of point spread functions on an individual pixel scale.
Optics Express, 28 (26), DOI: 10.1364/oe.409626

DESIS Validation at CHIME Preparation Site Camarena (Spain)

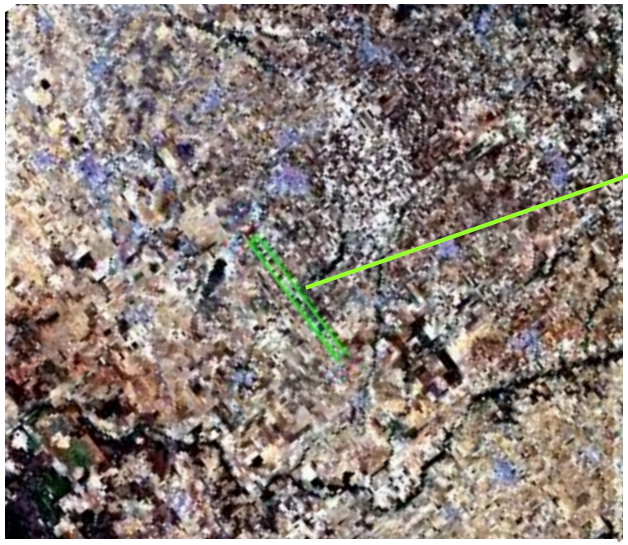
Airborne & in-situ reflectance measurements for the validation of

- L2A product (BOA surface reflectance)
- L1 product (radiometric calibration) by simulation of TOA at-sensor radiance
- Higher-level products such as Cover% (fCover) or Soil Organic Matter





August 2020



DESIS scene

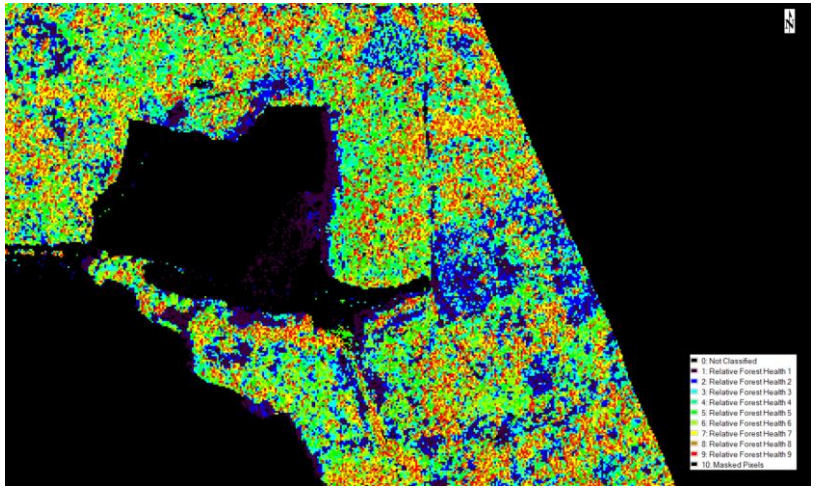
HySpex flight line

EnMAP Preparation at University Forest Sailershausen (Germany)

Airborne and ground based spectroscopic measurements in 2018 & 2020 to investigate drought stress effects on different tree species

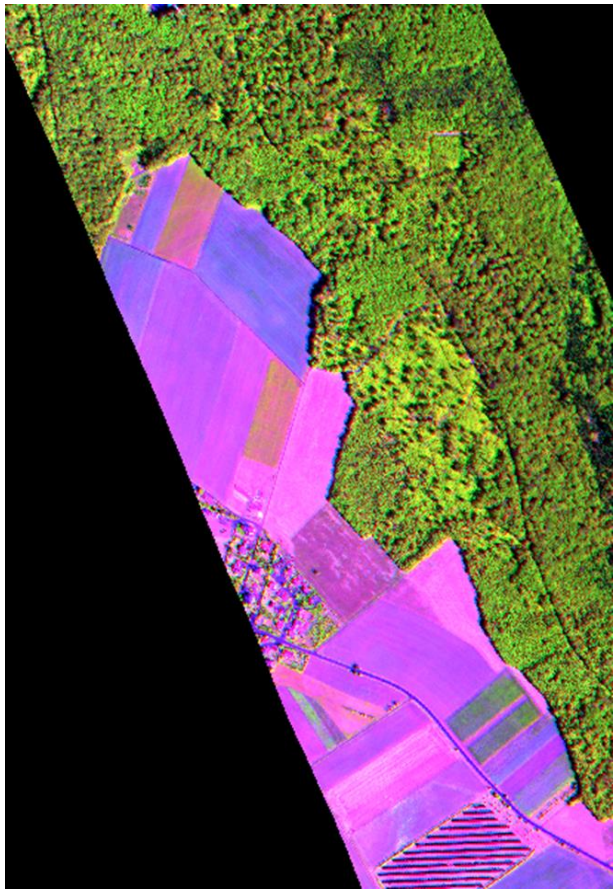
Additionally regular scientific activities for research and education are organized by Julius-Maximilians-Universität of Würzburg (JMU)

JMU established patches to study multidiversity and multifunctionality in production forests
→ monitoring since 2018



Forest health classification


Ground based measurements


HySpex false color RGB

Sentinel-2 Validation at Mecklenburg Lake District (Germany)

Airborne and ground based spectroscopic measurements over land and water in May 2018
Validation of the Sentinel-2 L2A product (BOA surface reflectance)