

# Selected Results Obtained with DLR's Airborne EnMAP Demonstrator

C. H. Köhler<sup>1</sup>, A. Baumgartner<sup>1</sup>, M. Bachmann<sup>1</sup>, S. Holzwarth<sup>1</sup>, B. Pflug<sup>1</sup>

1) German Aerospace Center (DLR), Earth Observation Center, Oberpfaffenhofen, Germany

The DLR Earth Observation Center (EOC) in Oberpfaffenhofen has been an active contributor to the hyperspectral remote sensing community for more than 25 years. Since 2007 it operates the ISO-certified Optical Airborne Remote Sensing (OpAiRS) user service which aims to provide highly accurate airborne hyperspectral data to DLR scientists and their cooperation partners for the development of the next generation of remote sensing applications. The preparation of upcoming hyperspectral satellite missions and the validation of current space-borne earth observation instruments has been a core activity of OpAiRS since its foundation. From 2012 onwards, we have been operating two HySpex sensors (VNIR-1600 & SWIR 320m-e) as demonstrator for the national German EnMAP mission. Since then, more than 100 datasets have been collected over central Europe for various applications including preparatory work for the EnMAP mission as well as validation measurements for the DESIS spectrometer on-board the ISS and the ESA Copernicus mission Sentinel-2. In order to ensure a continuous high data quality, we maintain a calibration laboratory for airborne sensors, which allows us to characterize the spectral, geometric and radiometric properties of our sensors on a regular basis with benchmark accuracy traceable to national standards. The laboratory was originally set-up in 2008 as Calibration Home Base (CHB) for the airborne imager APEX funded by ESA and it has been actively extended for our calibration related research since then. The presentation will focus on Cal/Val activities for DESIS and Sentinel-2 based on OpAiRS data, and we will also present selected results from OpAiRS campaigns within the scope of the EnMAP mission preparation. Additionally, we are going to provide an overview of current advances in calibration techniques and their influence on the HySpex product quality. Most notably we will discuss a novel method for the homogenization of spectral and geometric response functions, which we developed to reduce systematic errors in inter-instrument comparisons. We also use this method to generate an improved HySpex Level 1C product, which minimizes many typical instrument artifacts and thus simplifies working with the product.