REVIEW OF THE AISA HYPERSPECTRAL FLIGHTS IN THE SUMMER 2011

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Airborne hyperspectral remote sensing campaign focusing on vegetation studies was conducted this summer in southern Finland. The main instrument in these flights was our recently acquired AISA Eagle II pushbroom sensor manufactured by SPECIM. This is sensitive primarily to the visible domain of the spectrum. The objectives of the campaign were to gather data for forest, agricultural and BRDF studies, as well as to assess the operation and quality of our new instrument. The flights, which were operated by *Carelia Copters* on an airplane platform, took place during a two week period late July.

AISA Eagle II has a wavelength range of ca. 400-970 nm and is capable of resolving spectral features down to 3.3 nm. With a relatively wide 37.7 degree FOV, spatial resolution varied from 0.3 m to 2.0 m depending on the imaging geometry and flight altitude.

Airborne imaging spectroscopy has a capability of producing images of high spatial and spectral resolution. Therefore, it effectively provides the means e.g. for studies of plant and tree species identification, canopy reflectance modeling and estimation of various biophysical characteristics. Based on these ideas, measurement flights were made to Hyytiälä forest research station and agricultural test fields in Viikki, Helsinki. Forest studies were mainly carried out in ca. 0.6 m spatial resolution and 9.2 nm spectral sampling. More accurate spectral sampling was not achieved due to illumination conditions. In the case of agricultural test fields, on the other hand, keeping the 9.2 nm spectral sampling allowed us to use a slightly better spatial resolution of 0.4 m.

In addition, airborne measurements of reflectance anisotropy were conducted over relatively homogeneous agricultural fields at Kiiala Manor located in Porvoo. These measurements were, however, affected by relatively cloudy conditions that will certainly make the estimation of directional reflectances quite difficult.

For purposes of evaluating the performance and calibration of our instrument, yet another measurement flight was made to the remote sensing calibration site in Sjökulla, Kirkkonummi maintained by Finnish Geodetic Institute. Early inspection of the data has indicated that the instrument performed well, as expected, although precise geometric rectification of the images requires more attention. Overall, the campaign in its complexity was successful and the quality of the data products seems promising.