

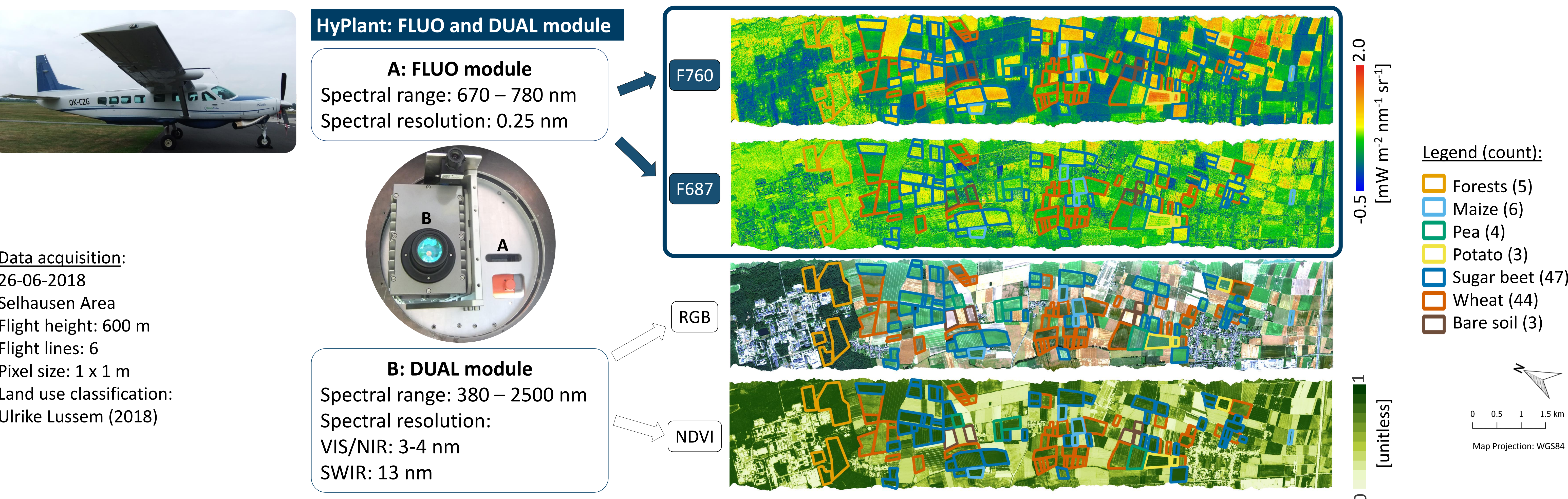
# Quality assessment of Sun-Induced Fluorescence maps from the airborne imaging spectrometer HyPlant

V. Krieger<sup>1,2</sup>; B. Siegmann<sup>1</sup>; D. Emin<sup>1</sup>; M. Matveeva<sup>1</sup>; P. Rademske<sup>1</sup>; P. Heid<sup>1</sup>; L. Grünhagen<sup>1</sup>; O. Muller<sup>1</sup>; S. Cogliati<sup>3</sup>; R. Colombo<sup>3</sup>; A. Damm<sup>4</sup>; U. Lussem<sup>5</sup>, and U. Rascher<sup>1</sup>

1: Institute of Bio- and Geosciences, IBG-2 Plant Sciences, Forschungszentrum Jülich GmbH, Germany;  
2: Rheinische Friedrichs Wilhelm Universität Bonn, Germany;  
3: Remote Sensing of Environmental Dynamics Lab., DISAT, University of Milano, Italy;  
4: Department of Geography, University of Zurich, Switzerland  
5: Institute of Geography, University of Cologne, Germany

## Motivation:

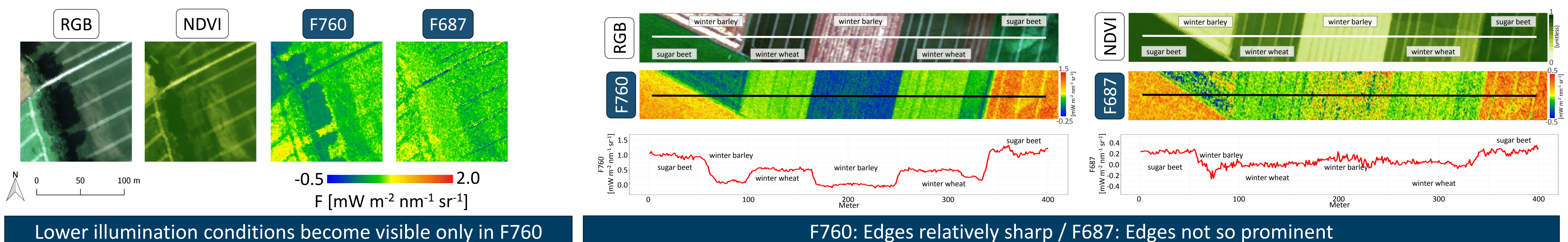
Asses the quality of Sun-Induced Fluorescence (F) maps, retrieved using the iFLD method from an airborne acquisition with HyPlant Sensor during the 2018 ESA FLEXSense campaign.



## Spatial effects:

F on sunlit pixels > F on shaded pixels (for same vegetation)

Sharp edges between transition zones (vegetation – bare soil)

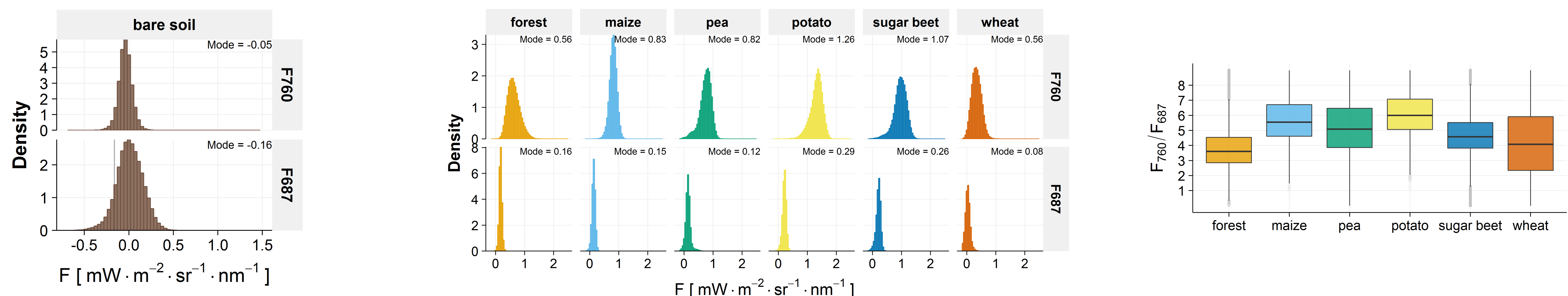


## Absolute pixel values :

No vegetation = No F signal

Vegetation = F signal between 0 – 3  $\text{mW m}^{-2} \text{ sr}^{-1} \text{ nm}^{-1}$

Ratio F760/F687

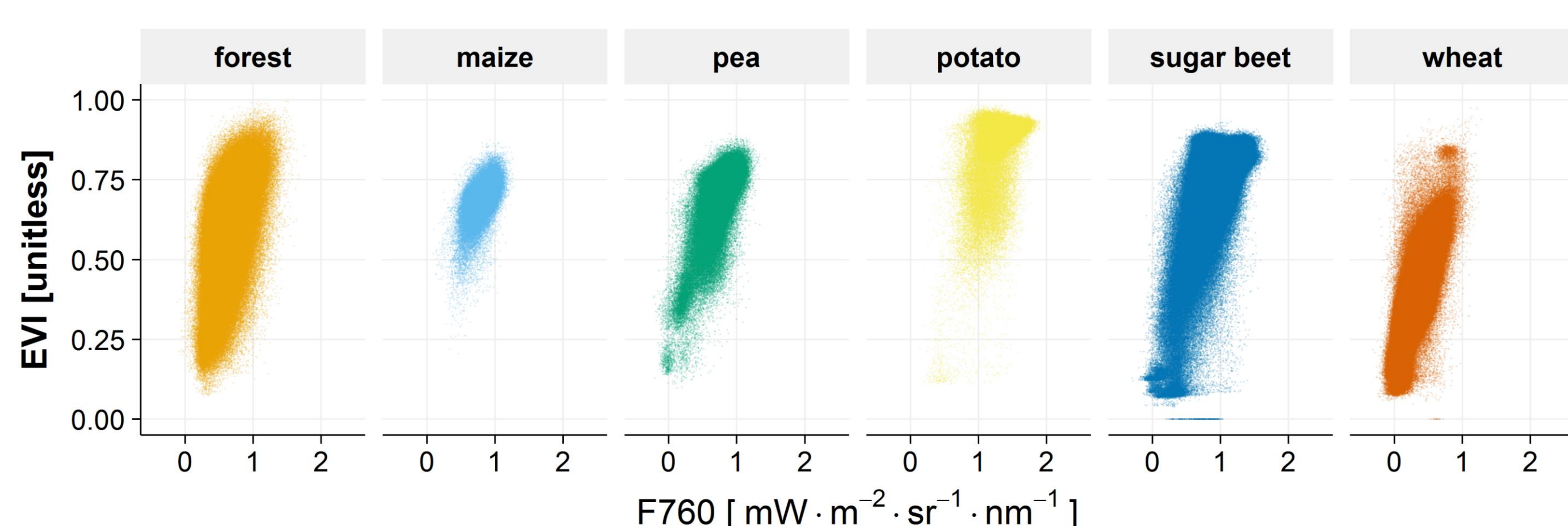


F values around zero on bare soil.

F760 values in expected range. F687 values numerically slightly lower.

Different ratios for different crops/forest.

## F ≠ reflectance based signal (but positive correlation)



F760 signal correlates positively with VI's (1<sup>st</sup> order effect). However, no one-to-one correlation. Emission-based F signal provides additional information from signal to reflectance-based VI's (2<sup>nd</sup> order effect).

## Conclusion:

- First F760 and F687 maps on regional scale from HyPlant imaging spectrometer from 2018 ESA FLEXSense campaign
- Data quality is high for F760 map (shadows visible, resolving sharp edges) despite some retrieval issues with F687 (much lower signal)
- Functional diversity of five crop types and forest visible in absolute F values, distribution patterns and F760/F687 Ratios
- F760 signal adds additional information to reflectance based measurements.