



## imVisIR – spatially explicit characterisation of soil organic matter quality on the pedon scale

Markus Steffens (1), Michael Kohlpaintner (2), and Henning Buddenbaum (3)

(1) TU München, Lehrstuhl für Bodenkunde, Freising, Germany (steffens@wzw.tum.de), (2) TU München, Fachgebiet Waldernährung und Wasserhaushalt, Freising, Germany, (3) Trier University, Environmental Remote Sensing and Geoinformatics, Trier, Germany

Organic matter (OM) is an important soil component controlling many chemical and physical properties ranging from nutrient and pollutant sorption to aggregate stability and water holding capacity. Advanced techniques and sophisticated methods have been developed to characterise and separate qualitatively different fractions of SOM. Despite its importance and the technical progress, two main deficiencies still constrain the comprehensive analysis of OM quantity and quality in soils: 1) Most of the techniques (e.g. solid state  $^{13}\text{C}$  NMR spectroscopy or fourier-transformed infrared spectroscopy) are destructive so that the sample is lost after the measurement; and 2) SOM quantity and quality generally show a heterogeneous spatial distribution across many scales which is not considered in an adequate way in most studies since the analytical techniques require substantial amounts of soil material impeding the sampling of small structures. The natural arrangement of particles is disturbed and information about the spatial variability and association with other particles is lost. Therefore, an imaging technique that non-destructively measures SOM quantity and quality with a high spatial resolution on the pedon scale is needed. We show the potential of laboratory imaging Vis-NIR spectroscopy for the qualitative mapping of SOM on the pedon scale.