Calibration of hyperspectral data for soil organic carbon determination

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The quantification of carbon fluxes between soil and the atmosphere is often difficult due to the spatial variability of Soil Organic Carbon (SOC) content at different scales (local, field and regional). This problem can be addressed by using a high sampling density. In this paper presenting the results of the AHS2005 hyperspectral flight campaign, ground and remote-based VNIR spectroscopy are two techniques explored to determine SOC in croplands. AHS and field ASD spectra are related to SOC content with Partial Least Square Regressions. Their performances are compared in relation with a traditional routine soil analysis method (Walkley-Black). The temporal and spatial robustness of the calibrations obtained are assessed by joining the dataset with previous samples collected during the CASI2003 flight campaign. It is concluded that the development of regional spectral libraries and the setting of spectral measurement protocols under field conditions are needed to use these methods as operational analytical tools in the future.