

## **Airborne VNIR-SWIR hyperspectral remote sensing for environmental urban mapping, application to Nantes, France**

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Remote sensing is an efficient mean of mapping the nature and structure of urban surfaces and canopy. This technique may be used to improve the composition description of both surfaces and objects and to provide additional input information for climate models.

With the advent of hyperspectral imaging spectrometers, the measurement of reflected radiation of an urban environment offers new possibilities to assess the composition of the urban fabric with spectroscopic techniques. To effectively extract this information from a hyperspectral dataset we are developing a mapping strategy based on a hierarchy of urban fabric spectral signatures.

Our test site is the SAP, the permanent hydro-meteo-climatological observation site ofIRSTV, which is the north-east sector of Nantes, France, between the Erdre and Loire rivers. It was surveyed in July 2008 by the airborne HyMap imaging spectrometer with reference field measurements. Further, field acquisitions were conducted using a portable ASD spectrometer in order to document a reference spectral signature catalogue of the most relevant fabrics in the surveyed area.

Based on the spectral signatures of these materials, an index is defined to organize the information into a hierarchy including two data subsets : vegetated and non vegetated fabrics. A spectral metric is then applied to identify the best match between each pixel spectrum and a non vegetated catalogue-referenced spectrum to produce an accurate classification map.