



Assessment of isoprene emissions by hyperspectral data (HYPI project)

Manuela Balzarolo (1), Luc Bertels (2), Nicola Arriga (1), Miguel Portillo Estrada (1), Terenzio Zenone (1), Stephanie Delalieux (2), Josep Peñuelas (3), Iolanda Filella (3), Jean-François Müller (4), Trissevgeni Stavrakou (4), and Reinhart Ceulemans (1)

(1) University of Antwerp, Department of Biology, Centre of Excellence PLECO (Plant and Vegetation Ecology), Wilrijk, Belgium (manuela.balzarolo@uantwerpen.be), (2) VITO, TAP Remote Sensing Unit, Mol, Belgium, (3) CSIC, Global Ecology Unit CREAM-CSIC-UAB Catalonia, Spain, (4) BIRA-IASB, Belgian Institute for Space Aeronomy, Brussels, Belgium

Isoprene emissions have an impact on atmospheric chemistry because they lead to the formation of photochemical smog, of ozone and of other secondary pollutants. Isoprene emitted by plants can be directly quantified at the leaf level through cuvette measurements and at the canopy level using the eddy covariance technique. Since these measurements are scarce, isoprene emissions at the canopy level in different biomes have not been quantified with available models and field measurements. The variation of isoprene emissions can be studied by remote sensing techniques through the detection of formaldehyde or through detectable changes in photosynthetic pigment concentrations. It has recently been shown that there is a strong relationship between isoprene emissions at the leaf level and the photochemical reflectance index (PRI), a remotely sensed vegetation index based on the xanthophyll cycle. The existence of a relationship between isoprene emissions and hyperspectral vegetation indices at the canopy level has, however, not been demonstrated. The HYPI project examines the relationship of isoprene emissions, hyperspectral reflectance and derived vegetation indices (e.g. PRI) at leaf and canopy levels. Therefore, an experimental set-up, integrated over the leaf and canopy levels, was set-up in a high-density poplar plantation in Flanders (Belgium) during the 2016 growing season. Results obtained from leaf and canopy measurements will be presented during the meeting.