

EARTH OBSERVATION SYMPOSIUM (B1)  
Future Earth Observation Systems (2)

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## GREENHOUSE GAS MONITORING MISSIONS FROM SPACE

**Abstract**

Space missions are a valuable asset to improve our understanding and our monitoring of greenhouse gas effects on the global climate. Through their capacity to offer global repetitive measurements, they allow in particular to trace greenhouse gas fluxes, and to identify the nature and the capacity of sources and sinks. CNES, the French Space Agency, is currently planning two missions dedicated to measurement of atmospheric concentrations of carbon dioxide and methane (in cooperation with the German DLR). Both missions will be flown using the new generation of CNES's highly successful Myriade product line, named Myriade Evolutions, and offering increased payload hosting capability. The MicroCarb mission, dedicated to measurement of atmospheric carbon dioxide, will be launched in 2018. It is a successor to other CO<sub>2</sub> missions such as GOSAT-Ibuki or OCO-2, and offers similar performances at an improved affordability. Carbon dioxide measurement is based on a dispersive spectrometer working in 3 spectral bands in the visible and near infrared domains. Measurements are performed in Nadir viewing conditions over land, and aiming at the Sun glint over the oceans. Additional measurement modes are used for instrument calibration. The MERLIN mission measures spatial and temporal gradients of atmospheric methane columns on a global scale and is due for launch in the timeframe of 2016. The payload, supplied by the German DLR, is an Integrated Path Differential Absorption LIDAR. In order to offer a global coverage, measurement are performed over the whole orbit, with no interruption. Astrium is an active player in the field of atmospheric chemistry missions, and is supporting CNES for the definition of both satellites. As for the first generation of Myriade satellites, Astrium is also participating in the definition of the Myriade Evolution standards, together with CNES. This article presents how this new standard is applied to the definition of highly affordable greenhouse gas monitoring missions.