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# MICROCARB: ATMOSPHERIC CO2 MONITORING FROM MICRO-SATELLITE

**Abstract**

MicroCarb is a scientific project whose goal is to monitor the sources and sinks of carbon dioxide at a global level. The increase of greenhouse gases concentration is the main cause of the observed climate change. The products delivered by MicroCarb will be used by the scientific community in order to improve the understanding of the processes of exchange of the CO2. MicroCarb will provide accurate measurements of the concentration of the atmospheric CO2 over the globe thanks to a spectrometer embarked on a micro satellite placed on a near polar low earth orbit. MicroCarb is the first dedicated project in Europe for CO2 monitoring from space and will support the contribution of Europe alongside the other space countries which have already deployed similar projects (USA, Japan, China). MicroCarb will help to prepare future operational projects.

CNES, the French space agency, is in charge of the system development in cooperation with UKSA. Both instrument concept and platform capabilities have been optimized in order to limit the satellite budgets within a 160kg/110W envelope while achieving high level performances (accuracy better than 1 ppm on CO2 concentration). In comparison with flying missions, the satellite is 3 times smaller, and is able to acquire one additional oxygen band to improve measurement accuracy. The preliminary design review has been held in march 2017 and demonstrates the feasibility of the design and the level of performances.

This article will address the MicroCarb mission, it will describe all the different modes dedicated to the scientific global monitoring mission but also the probationary modes dedicated to anthropic CO2 measurement. It will also describe the project organisation and activities shared between UK and France. Satellite design, bus and payload will be described and preliminary performances addressed to demonstrate the interest of the concepts.