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THE MICROCARB PROJECT: AN INITIATIVE FOR A GLOBAL MONITORING OF THE CO2 ATMOSPHERIC CONCENTRATION

Abstract

The permanent increase of the greenhouse gases concentration in the atmosphere due growing human activities since the beginning of the industrial age, is clearly identified as the origin of the present climate change. Among these gases, Carbon dioxide is the one with the most important contribution. The CO2 atmospheric concentration results from complex exchange processes between the sources and the sinks. A continuous monitoring is necessary in order to improve the understanding of these processes and analyze their seasonal and long term variations. A space system provides the opportunity of a global coverage as well as a unique reference for the different measurements. MicroCarb will measure the CO2 atmospheric concentration at global level and map the sources and the sinks, from a low earth orbit, with the level of performances required to reduce the uncertainty affecting the existing exchange models. It is the first project at European level dedicated to this measurement MicroCarb uses a high resolution spectrometer measuring the solar spectrum reflected by the earth in 4 SWIR narrow bands where O2 or CO2 absorption rays are present; the instrument is carried on a micro satellite weighing less than 200 kg. It implements a wide range of operating modes and pointing capacities in order to explore different viewing strategies and provide calibration capacities. The development is conducted by the CNES with European partners; it was initiated in 2015 and the launch is targeted for 2021 and is presently in its realization phase. The presentation will focus on the scientific objectives, describe the organization and the actors of the program, then provide a technical description of the project with emphasize on the original and innovative aspects and conclude with the project progress status.