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

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THE MICROCARB MISSION, AN INNOVATIVE PATHFINDER TO CO2 MONITORING

Abstract

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MicroCarb is a space mission designed to monitor the atmospheric load of Carbon Dioxide with the aim of improving our understanding of the Carbon cycle. It therefore has similar mission and monitoring objectives as the currently flying GOSAT, OCO-2 or TANSAT satellites. The project is conducted by the CNES under French ANR funding, in partnership with the UK Space Agency, and involves the scientific community from both France and UK. A cooperation with Eumetsat for the ground segment implementation and a support from the European Commission through a H2020 programme delegated to ESA are also in place. Compared to similar ongoing space mission, MicroCarb is fitted into a 180 kg microsatellite. Its instrument, based on a passively cooled grating spectrometer, includes an additional spectral band at 1.27 m on top on the 3 dedicated to CO2 and O2. It is expected that this additional band will allow a better estimate of the surface pressure and atmospheric scattering, despite its contamination by airglow. Microsatellite agility combined with an across track steerable mirror will allow to cover both nadir and over ocean glint data sampling, but also pointing to targets of opportunities. All these MicroCarb operating modes aim at an optimal science return, with glint, nadir, target, scan and "city" modes. The later makes it possible to acquire dense sampling over a target of opportunity, such as a power plant or a large city. The project is currently completing its assembly phase (phase D) and the launch is scheduled for end of 2023. The presentation will give an overview of the program, then focusing on instrument design, the operating modes, associated performances, the data processing and the expected scientific impact, but also foreseen first year Cal/Val plan.