THE MICROCARB INSTRUMENT

Sébastien Lopez, Philippe Bernard, Laurent Georges, Frederick Pasternak (a) Véronique Pascal (b)

a – Airbus D&S France - 31, Av. des Cosmonautes – 31 402 Toulouse Cedex 4– France b – CNES – 18, avenue Edouard Belin – 31 401 Toulouse Cedex 9

Abstract: The COP21 climate conference has taken place in December 2015 in Paris, France. The agreement signed has enlightened the criticality of greenhouse gases in the global warming process. In this context, France has decided to kick-off the MicroCarb project that will allow for monitoring of CO_2 , a major greenhouse gas. The mission main objective is to monitor carbon fluxes between the atmosphere and the Earth surface. The project will provide data continuity after 2020 from a European source to the worldwide climate scientific community: MicroCarb will help improving the understanding of the carbon cycle and its implication on climate change.

AIRBUS Defence and Space has been selected by the French Agency CNES for the design and development of the MicroCarb instrument, able to monitor very precisely greenhouse gases concentration (better than 1 ppm for CO_2) in the atmosphere through passive sounding thanks to a very compact spectrometer, offering probationary capabilities to prepare next generation satellites (spectral imagery capability).

This presentation will describe the operating principle of the instrument, an innovative concept selected for its flexibility to accommodate the required spectral channels at a high level of performances. The instrument optical design will be presented, including the nadir pointing, sun glint tracking, and scanning capabilities. The instrument robustness to straylight and polarization sensitivity will be presented.

Keywords: MicroCarb, Instrument, Spectrometer, CO₂.



