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Author: Dr. JORDI FONTDECABA BAIG
Thales Alenia Space France, France, jordi.fontdecababaig@thalesalieniaspace.com

Mr. Alain Lamy
Centre National d'Etudes Spatiales (CNES), France, Alain.Lamy@cnes.fr
Mr. Vincent Martinot
Thales Alenia Space France, France, vincent.martinot@thalesalieniaspace.com

OPTIMIZATION OF MICROCARB MISSION: ACQUISITION, STATION KEEPING AND END OF
LIFE

Abstract

Microcarb is a French Space Agency Mission dedicated to the study of the greenhouse gas and the carbon dioxide. The launch is foreseen on 2018 and the industrial studies have been carried on during 2013. MicroCarb will integrate existing A-train constellation and must be compliant with A-train rules in terms of collision risk and phasing with existing satellites. These requirements add complexity to the LEOP-IOAP phase as well as to the operational phase. Moreover, the Myriade platform used for this mission has a small propellant reservoir and the total ΔV capability of the satellite is small. Exhaustive analysis has been performed in order to optimize the manoeuvres all over the different phases of the mission. The satellite must be launched into an orbit lower than A-train to respect the avoidance region of the constellation. In order to minimize the raising manoeuvres, a technique taking profit of the J2 perturbation has been defined. The station keeping must be done considering the allowed control window as well as the relative distance with respect to the other satellites. The standard station keeping technique has been adapted to integrate these additional constraints. The end of life strategy must be compliant with the French Space Law, which requires a desorbiting in the following 25 years after the end of the operational life of the satellite. The compliance must be tested with CNES software STELA and ELECTRA. This paper presents the details of the different phases of the mission as well as the process followed to reach final strategy.