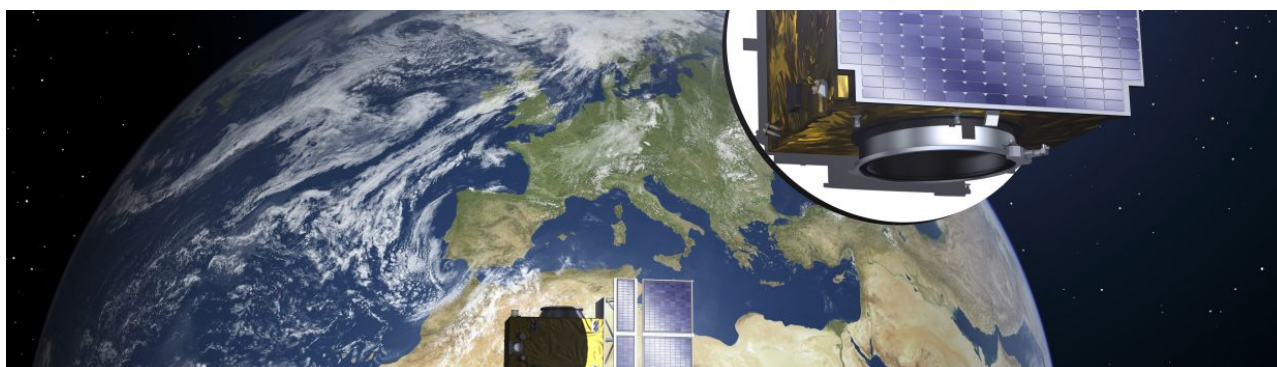




PROBA-3. Formation Flying Mission



SENER AEROSPACE & DEFENSE / SPACE / NAVIGATION / NAVIGATION EQUIPMENT / SPAIN

PROBA-3. FORMATION FLYING MISSION

Cliente: European Space Agency (ESA) **Fecha inicio: enero del 2012**

País: Spain **Fecha fin: enero del 2016**

PROBA is a space program managed by ESA for the in-orbit demonstration of platform and payload technologies. PROBA-3 aims to demonstrate precise formation flying technologies.

The mission consists of two small spacecrafts of 350 kg and 200 kg flying in a formation with relative position control accuracy of less than 1 mm. The two spacecraft will be controlled in space to behave as if they were part of a large ultra-stable rigid structure, and building for instance a huge telescope (with separated lens and detector). This virtual rigid structure will be also commanded to rotate and point to any desired direction. It will also be possible to set the relative distance of the two spacecraft from 25 to 250 meters (i.e. change the focus).

In order to complete the end-to-end validation of the formation flying technologies, a scientific instrument, a coronagraph, has been selected with the goal of taking pictures of the inner solar corona. The



coronagraph system is distributed over the two satellites; one carrying the detector and the second one carrying the Sun occulter disk.

The formation flying demonstration requires a low gravity gradient region that will be achieved during the apogee of a highly elliptical orbit. The selected orbit has perigee height of 600 km and 100 times higher apogee (60.000 km). Since formation cannot be maintained at perigee, formation breaks and reacquisition is required every 20 hours. The PROBA-3 spacecraft are designed to execute autonomously this orbital routine with no support from ground. PROBA-3 will also include additional experiments like the rendezvous demonstration with non-cooperative targets, applicable for instance in active space debris removal.

PROBA-3 is currently being developed by a large consortium with a Core Team of companies lead by SENER.

SENER will develop the Solar Array Deployment Mechanism (SADM) and the and Solar Array Hold Down and Release Mechanism (SAHRM) of the coronagraph spacecraft and will collaborate in the development of the Optical Bench Assemblies (OBA) of both spacecraft.
