Experience and Views of CGS on optimization of avionics/GNC/Sensors for exploration (planetary landing)
CGS

The proposed contribution to the Round Table will provide a description of the experience and views of Carlo Gavazzi Space for what concerns the optimization of Avionics/GNC/Sensor Suites for Exploration. In particular the area that has been considered is relevant to the Navigation architecture and algorithms for landing vehicles for exploration missions (e.g. landing on the Moon or on Mars). In the frame of our activities, a "clean sheet" approach has been implemented with the key targets of reaching:
- a simple overall architecture, with a reduced number of different sensors,
- an increase of overall performance in the navigation function and of robustness of the system,
- a reduced data processing workload.

In order to meet these objectives, CGS developed a Navigation concept for landing manoeuvres based on a specific algorithm called "QuickNav", that according to the results of the simulation analyses performed, provides significant improvements in all the mentioned areas with respect to corresponding state-of-the-art approaches. The considered concept addresses both absolute and relative navigation functions, and the required sensor suite foresees the utilization, in its basic variant, of only a camera and an IMU (while further performance increases could be obtained with additional sensors, e.g. an altimeter).