MAPPS: Science Planning and Simulation Tool for ESA Planetary Missions

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The Mission Analysis and Payload Planning System (MAPPS) is a multi-mission software system developed during the last 20 years to support the science operations planning for the ESA planetary missions.

Developed initially only to visualise the coverage of MEX experiments onto the Martian surface. Progressively, the tool has been extended to provide planning capabilities and to support other missions operationally. In the past: SMART-1, Venus Express and Rosetta. Today and in the coming years: Mars Express, ExoMars2016, BepiColombo, SolarOrbiter, JUICE and EnVision.

The tool main objective is to assist the Science Ground Segment Team (SGS), located at the European Space Astronomy Centre (ESAC) near Madrid, with the complex process of instrument operations scheduling, simulation and validation. The tool receives as inputs the observations requests from the instrument teams, which are merged into a plan that the science operations engineers can run. The instruments are simulated and modelled extensively, allowing to find any possible conflict or constraint violation in the plan. The result of a validated plan is the generation of a multi-instrument operational timeline that is sent to the MOC for uplink to the spacecraft.

Here we present the latest MAPPS features that help the SGS Teams in ESA to achieve their goal of planning scientific operations in an efficient and optimised way.