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BepiColombo Science Operations Analysis and Planning: Maximising Science Return

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BepiColombo is a ESA-JAXA Mission to the planet Mercury. The mission consists of two orbiters dedicated to the detailed study of the planet and of its magnetosphere, the Mercury Planetary Orbiter (MPO) and the Mercury Magnetospheric Orbiter (MMO). The MPO is ESA's scientific contribution to the mission. It is a three-axis-stabilised, nadir-pointing spacecraft that will be placed in a polar orbit, providing excellent spatial resolution over the entire planet surface.

The Science Operations Analysis and Planning (SOAP) for MPO will be carried-out by the Science Ground Segment (SGS) at ESAC, Spain, in conjunction with the 11instrument teams, in-line with the overall mission characteristics and operational constraints.

Driven by the operational product delivery timeline, the SOAP activity will be a multi-cycle process that will consider the complete nominal mission duration. In this manner, the contribution of scheduled observations to the science objectives, the total data volume generated, and their seasonal interdependency, can be tracked.

The Science Planning System will be the system used for the planning, preparation and tracking of the MPO science operations throughout the mission. It will be used to define instrument team observations and process them into executable operational timelines. It will be used to track their execution with the intention of tracing the science end-products back to the original observation requests and ultimately to the high level mission science objectives.

The Science Planning System will consist principally of 4 components: An Observation Catalogue, a Science Planning Repository (SPR), a Planning Module and a Simulation Module. This paper will summarise the Science Teams' interface to MPO's Science Planning System and highlight how it will be used to maximise the science return of the mission.