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BepiColombo Euro-Japan Joint mission to Mercury: MMO Project Status update

Hajime Hayakawa^{1*}, Hironori MAEJIMA¹, BepiColombo MMO Project Team²

¹ISAS/JAXA, ²BepiColombo MMO Project

BepiColombo is a ESA-JAXA joint mission to Mercury with the aim to understand the process of planetary formation and evolution in the hottest part of the proto-planetary nebula as well as to understand similarities and differences between the magnetospheres of Mercury and Earth.

The baseline mission consists of two spacecraft, i.e. the Mercury Planetary Orbiter (MPO) and the Mercury Magnetospheric Orbiter (MMO). The two orbiters will be launched in 2014 by an Ariane-5 and arrive at Mercury in 2020. JAXA is responsible for the development and operation of MMO, while ESA is responsible for the development and operation of MPO as well as the launch, transport, and the insertion of two spacecraft into their dedicated orbits.

JAXA has made conceptual design of the MMO spacecraft system (including the interface with the cruising composite system in collaboration with ESA) with model payload. MMO is designed as a spin-stabilized spacecraft to be placed in a 400 km x 12000 km polar orbit. The spacecraft will accommodate instruments mostly dedicated to the study of the magnetic field, waves, and particles near Mercury.

Selection of the PI responsible instruments was finished on 2004. Preliminary Design Review (PDR) for MMO project has finished on Mar. 2008. PDR for ESA BepiColombo project is closed on end of Oct. 2009.

Mechanical Test Model (MTM) test was successfully finished on Jul. 2009. Thermal Test Module (TTM) test under the condition of 1SC light was finished on Dec. 2009. TTM test using Infra-red (IR) panel will be performed on Feb. 2010. After that TTM will transport to ESA/ESTEC and test using Large Solar Simulator (LSS) facility will be performed. Various electrical tests using Engineering Model (EM) are on-going parallel to the MTM/TTM tests. Subsystem level Critical Design Review (CDR) will be start from Mar. and System CDR is scheduled on Oct. 2010. After the CDR, Flight Model (FM) manufacture will be started.

6th BepiColombo science working team (SWT) meeting, which discusses science related matters, was held on Oct. 2009. In this paper, we will report the latest information of MMO project status.

Keywords: Mercury, Planetary Exploration, International collaboration