Current Status of Japanese Participation in JUICE (Jupiter Icy Moons Explorer)

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JUICE (Jupiter Icy Moons Explorer) was launched from Guiana Space Centre at 9:14 local time on April 14, 2023. After the successful launch, initial checkout of the onboard instruments was conducted between 16 April and 3 July during the Near-Earth Commissioning Phase (NECP). The results of the initial checkout were presented at the Near-Earth Commissioning Review Board Meeting held on 19 July at ESTEC (European Space Research and Technology Centre).
The extension of the magnetometer boom and the antenna of one of the onboard instruments RIME (Radar for Icy Moon Exploration) was conducted at the beginning of the Commissioning Phase. Although the magnetometer boom was deployed without any problems, the deployment of the RIME antenna stopped midway, and it took some time to resolve the problem. It was confirmed that RPWI (Radio & Plasma Waves Investigation), PEP/JNA (Plasma Environment Package/Jupiter Neutrals Analyzer), GALA (Ganymede Laser Altimeter), and SWI (Submillimeter Wave Instrument), for which Japanese groups provided part of the hardware, were functioning properly, including the successful antenna deployment of RPWI. It was also confirmed that JMAG (JUICE Magnetometer Package) and JANUS (Jovis, Amorum ac Natorum Undique Scrutator) for which Japanese groups are participating in as science Co-Investigators had no problems.
As for RPWI, there was no problem with the hardware, but some noise was found on the high frequency wave receiver due to electro-magnetic interference from the satellite bus. As for PEP/JNA, a low voltage test and a low-level high voltage power on test were conducted and it was confirmed that PEP/JNA functioned properly. For GALA, it was confirmed that the laser beam detection part provided by Japanese group was also functioning properly, although the test was conducted under the condition that there was no object to reflect the laser beam.
JUICE will be inserted into Jupiter's orbit in July 2031 after more than 8 years of interplanetary transfer with Earth/Moon-Venus-Earth-Earth gravity assists. JUICE will observe the three Jupiter icy Moons, Europa, Ganymede, and Callisto, which may have subsurface ocean under the icy crusts, and will be the world’s first Icy Moon orbiter when it is inserted into Ganymede orbit in December 2034. Since the launch was performed on a nominal plan and the orbit injection accuracy by the launch vehicle was excellent, the observation at an altitude of 200 km around Ganymede is becoming a reality because there is enough fuel to spare. The nominal mission of JUICE will end in September 2035 after observing the largest Icy Moon in the solar system: Ganymede in detail. JUICE mission is still scheduled to continue for almost 15 more years until the project is completed, making JUICE a long-term project that will span a quarter of a century.

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