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WITH ADITYA-L1 SPACECRAFT PLACED IN HALO ORBIT, FOCUS IS ON DATA COLLECTION ON SUN

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Now that Aditya-L1 has arrived at the L1 point, it will take another 3 months for all its scientific payloads to become fully operational. Photo: X/@ISROSpaceflight

With the Indian Space Research Organisation (ISRO) successfully placing the Aditya-L1 spacecraft in a halo orbit around the Lagrangian point (L1) on January 6, the focus is now on the operation of the scientific instruments and data collection.

Aditya-L1 is a satellite dedicated to the comprehensive study of the sun with seven payloads.

The seven payloads aboard the satellite are: Visible Emission Line Coronagraph (VELC), Solar Ultraviolet Imaging Telescope (SUIT), Solar Low Energy X-ray Spectrometer (SoLEXS), High Energy L1 Orbiting X-ray Spectrometer (HEL1OS) , Aditya Solar wind Particle Experiment (ASPEX), Plasma Analyser Package For Aditya (PAPA) and Advanced Tri-axial High Resolution Digital Magnetometers.

Now that #AdityaL1 has arrived at the L1 point, it will take another 3 months for all its scientific payloads to become fully operational.

While some payloads (eg. SUIT) were turned on by #ISRO during the cruise to L1, over the next 3 months the rest of the instruments will… pic.twitter.com/npxvMQsDm6

According to the ISRO, a satellite placed in the halo orbit around the L1 point has the major advantage of continuously viewing the sun without any occultation/eclipses.

This will provide a greater advantage of observing the solar activities and its effect on space weather in real time. The spacecraft carries seven payloads to observe the photosphere, chromosphere and the outermost layers of the sun (the corona) using electromagnetic and particle and magnetic field detectors.

The payloads have been switched on and some of them have already collected data.

The Supra Thermal and Energetic Particle Spectrometer instrument, a part of the ASPEX payload, had begun the collection of scientific data in September 2023.

The HEL1OS has recorded the impulsive phase of solar flares; Aditya Solar wind Particle Experiment (ASPEX) payload has also commenced its operations; the Solar Ultraviolet Imaging Telescope (SUIT) instrument has successfully captured the first full-disk images of the sun in the 200-400 nm wavelength range.

The Visible Emission Line Coronagraph (VELC), which is the primary payload of the spacecraft, was also switched on during the cruise phase.

VELC, developed by the Indian Institute of Astrophysics (IIA), Bengaluru, will be able to observe the corona continuously from the L1. VELC would be sending 1,440 images of the sun in a day.

“The VELC payload was switched on and tested during the cruise phase. Once the spacecraft is in halo orbit we have to carry our tests to ensure that everything is alright before we commence the experiments. Once we make sure that the instrument is pointed towards the centre of the sun we have to carry out all the calibration observations and the performance of all the electronic components onboard would also be tested,” Ramesh. R, principal investigator of the VELC payload, told *The Hindu*.

Mr. Ramesh added that the VELC payload is most likely to start sending images by the end of January.