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ISRO SUCCESSFULLY DEPLOYS MAGNETOMETER BOOM ON ADITYA-L1 IN HALO ORBIT

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The 6-metre long magnetometer boom on the Aditya-L1 satellite. | Photo Credit: X@isro

The Indian Space Research Organisation (ISRO) on Thursday, January 25, said that the 6-metre long magnetometer boom on the Aditya-L1 satellite has been successfully deployed.

The space agency said that the magnetometer boom was deployed in the Halo orbit at the Lagrange point L-1, on January 11, 2024. The boom had been in stowed condition for 132 days since the Aditya-L1 launch.

ISRO said that the boom carries two state-of-the-art, high-accuracy fluxgate magnetometer sensors that measure the low intensity interplanetary magnetic field in space.

“The sensors are deployed at distances of three and six metres from the spacecraft body. Mounting them at these distances minimises the impact of the spacecraft-generated magnetic field on measurements, and using two of them assists precise estimation of this influence. The dual sensor system facilitates cancelling out the spacecraft’s magnetic influence,” ISRO said.

The boom segments are constructed from carbon fibre reinforced polymer and serve as interfaces for the sensor mounting and mechanism elements.

The articulated boom mechanism comprises five segments interconnected through spring-driven hinge mechanisms, allowing for folding and deploying actions.

“The deployment occurs in an accordion fashion, controlled by a novel patented Kevlar closed control loop mechanism, with hinges locking the segments into the deployed configuration,” ISRO said.

It added that during the stowed condition, the boom is securely held in position by two hold-downs, transferring launch loads to the spacecraft body.

A thermal cutter-based release system is employed to execute the boom deployment on command.

“Data received through the telemetry switches confirm the hold-down release, first motion, and

locking of all hinges. The observed in-orbit deployment time was approximately 9 s, well within the predicted range of 8 to 12 s. All telemetry indications for hinge locking and hold-down release were within nominal parameters," it added.

India's maiden solar mission Aditya-L1 reached the L1 point on January 6, 127 days after it was launched on September 2, 2023. The point is located roughly 1.5 million km from earth and enables the spacecraft to view the sun continuously