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FLIGHT TEST RESULTS OF A MINIATURIZED SPACE-BORNE GPS/QZSS RECEIVER

**Abstract**

The seek for miniaturization of space-based modules and instruments is an on-going trend. To fully verify the module or instrument, it is important to gain flight heritage. In the paper, the design and flight test of a miniaturized GPS/QZSS receiver for CubeSats are presented. Even though orbit determination is an indispensable task in a space mission and the use of Global Navigation Satellite System (GNSS) has been commonplace in most satellite programs, the use and especially flight test report of GNSS positioning in CubeSats has only been discussed sparsely due to the limits on the altitude and dynamics. An indigenous design is thus conducted to build a GPS/QZSS receiver that complies with the CubeSat standard. The miniaturized GPS/QZSS is installed into a 2U CubeSat IRIS-A which is launched in Q1 2022. At the early orbit phase, the data from the GPS/QZSS receiver are compared with two-line element data to identify the IRIS-A CubeSat among a cluster of satellites. The acquisition and tracking performance of the receiver are then tested for assessment and enhancement. In particular, the application of GPS and QZSS positioning in space environment is investigated.