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IONOSPHERE STUDIES FROM CUBESATS: INSPIRESAT-1, A 3U CUBESAT CARRYING THE
COMPACT IONOSPHERE PROBE.

Abstract

In the past, in-situ measurements in the Ionosphere have been limited primarily to satellites operating at altitudes above 600 km, where orbits are more stable due to reduced atmospheric drag and at high latitudes in mostly polar orbits. This has resulted in a paucity of long-term in-situ observations in the low and mid-latitude ionosphere and below 500 km in altitude. With its all-in-one Compact Ionosphere Probe (CIP) in-situ sensor payload, INSPIRESat-1 will be capable of addressing this data gap. CIP is capable of providing in-situ measurements of ion density, ion drift velocity, ion and electron temperature, and ion chemical composition. INSPIRESat-1 will address science questions on the occurrence rates and characteristics of plasma irregularity at low and mid latitudes and the spatial and temporal variations of the midnight temperature maximum (MTM) phenomena observed in the ionosphere. At an altitude between 400-600 km and inclination of 55°, INSPIRESat-1 will make complementary measurements with the Advanced Ionosphere Probe onboard the FORMOSAT-5 mission flying in a polar orbit at 720 km. The International Satellite Program In Research and Education (INSPIRE) is a global consortium of academic research institutes, universities and space agencies spearheaded by the Laboratory for Atmospheric and Space Physics (LASP) at the University of Colorado. INSPIRESat-1 is being developed jointly by universities in USA, Taiwan and India and scheduled for flight in first quarter of 2019. A PDR was held in 2017 and flatsat integration and testing was completed in summer 2017 at LASP at the University of Colorado, Boulder.