

IN-SITU IONOSPHERE MEASUREMENTS FROM THE COMPACT IONOSPHERE PROBE ON INSPIRESAT-1

Amal Chandran* ^(1,2), Loren C. Chang ⁽³⁾, Priyadarshan Hari ⁽⁴⁾, Kaustubh A. Kandi ⁽⁴⁾, Duann Yi ⁽³⁾, William Evonosky ⁽¹⁾

- (1) Laboratory for Atmospheric and Space Physics, University of Colorado, Boulder, Colorado, USA
- (2) School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore
- (3) Graduate Institute for Space Science, National Central University, Jongli, Taiwan
- (4) Department of Avionics, Indian Institute of Space Science and Technology, Trivandrum, India

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 at Boulder. INSPIRESat-1 is a cubesat being developed jointly by universities in USA, Taiwan and India and scheduled for flight in first quarter of 2019 on the Polar Satellite Launch Vehicle of the Indian Space Research Organization.

INSPIRESat-1 will carry the Compact Ionosphere Probe (CIP), an in-situ sensor payload, which will be capable of providing in-situ measurements of ion density, ion drift velocity, ion and electron temperature, and ion chemical composition. CIP is a miniaturized version of the Advanced Ionosphere Probe (AIP) flown successfully on FORMSAT-5 in August 2017. In the past, measurements in the Ionosphere have been limited 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. INSPIRESat-1 will be capable of addressing this data gap. 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.