

28th IAA SYMPOSIUM ON SMALL SATELLITE MISSIONS (B4)

Interactive Presentations: 28th IAA SYMPOSIUM ON SMALL SATELLITE MISSIONS (IP)

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INFRARED PLATFORM AS PAYLOAD FOR CUBESATS FOR EARTH OBSERVATIONS

Abstract

In recent years, intense storms have occurred at various locations in Mexico, particularly in the center and the eastern side of the country. Heavy precipitations have produced floods which, in some cases, have reached regions with large populations. These meteorological phenomena are becoming stronger and erratic year by year. Also, the Increase of air pollution from the Mexico City and the volcanic activity (which is of interest by itself), have contributed to the local climate alterations. The study of flows of atmospheric humidity in Mexico is a long-standing and pending item, it is known that a stream of humidity and clouds, called "Subtropical Jet Stream ", arrives from the Pacific Ocean and it even reaches to the Gulf of Mexico. The interaction of these humidity flows combined with the volcanic emissions and the increasing air pollution are not yet been studied thoroughly. One of the methods to remote sensing the precipitable water vapor (PWV) in upper stages of the atmosphere is the use of the Mid-infrared (MIR) and Near-infrared (NIR) emission channels.

The MIR and NIR wavelength bands of the electromagnetic spectrum, have been used in several fields of science and technology. The remote sensing techniques at MIR represents a powerful tool for the study of the Earth's atmospheric. In addition, the NIR wavelength range has been also useful for soil-covering and meteorological studies. Using these technics allow to estimate the PWV content at the atmosphere, an important parameter for the interchange of water around the globe.

For this purpose, we have developed an instrument called Infrared Platform that consists of four cameras: one mid-infrared, two near-infrared and one visible camera. The aim is to study the influence of these temperature scenarios on the weather conditions. Also, by using various NIR bands, the PWV will be estimated to study the humidity content at the atmosphere and its relation with weather conditions and as an input parameter for the temperature estimation with the MIR data. So far, we have been tested some components by developing our own atmospheric balloon probes as well as our reception stations to gather the data. The 12th of June 2019, in Vienna Austria, during the 62th session of the United Nations Office for Outer Space Affairs (UNOOSA), it was announced that this project was one of the selected experiment projects to be executed on board the upcoming Chinese Space Station.