

IAF EARTH OBSERVATION SYMPOSIUM (B1)
Interactive Presentations - IAF EARTH OBSERVATION SYMPOSIUM (IP)

Author: Dr. Hector Simon Vargas Martinez
Universidad Popular Autónoma del Estado de Puebla, Mexico, hectorsimon.vargas@upaep.mx

Mr. Charles Galindo Jr
Universidad Popular Autónoma del Estado de Puebla, Mexico, charles.galindojr@upaep.mx

Mr. Eugenio Urrutia
Universidad Popular Autónoma del Estado de Puebla, Mexico, eugenio.urrutia@upaep.mx

Mr. Steve Angel Figueroa Arronte
Universidad Popular Autónoma del Estado de Puebla, Mexico, stevearronte47@gmail.com

Ms. Sofia Naranjo Parrales
Universidad Popular Autónoma del Estado de Puebla, Mexico, sofia.naranjo@upaep.edu.mx

"GXIBA-1" PROJECT, OBSERVATION AND THE ANALYSIS OF ASH DISPERSION EMITTED
FROM ACTIVE VOLCANOES IN MEXICO.

Abstract

"The development of a 1U CubeSat, called "Gxiba-1", for the observation and the analysis of ash dispersion emitted from active volcanoes in Mexico will be beneficial in alerting the surrounding population of a major disaster" by this propose the UPAEP won the 6th round of the KiboCube competition, "KiboCUBE" is a programme of the United Nations Office for Outer Space Affairs (UNOOSA) in collaboration with the Japan Aerospace Exploration Agency (JAXA). In this paper we present the mission of the Gxiba-1 project, one payload being integrated into the cubesat structure is a 1.3 MP visible wavelength camera with a resolution of 350m per pixel, allowing for an ash dispersion of up to 650 Km in diameter to be identified and analyzed. The satellite will pinpoint a volcano within the Mexican borders by means of a GPS then stabilize the camera to capture its image using an active attitude control. Once the image is captured, the process of identifying the ash and its dispersion area will be carried out, with the result concentrated in a vector of no more than 256 characters, which will then be transmitted to the UPAEP Ground Station for subsequent analysis and decision-making. The compacted image will also be transmitted via Gxiba's second payload, the Aguilaboard assembly, to the Globalstar constellation. Several active volcanoes in Mexico have exhibited a change in their geologic behavior in recent history and scientists must review the ways in which active volcanoes in Mexico are being monitored currently. A major event by these active volcanoes would directly impact a considerable region of Mexico with almost 37 million inhabitants and their surrounding environment being affected. UPAEP has established a long-term program led by professors and staffed by both undergraduate and graduate level students to develop systems to monitor volcanic activity in Mexico. The development of the satellite will be carried out mainly by students of the aerospace engineering program, thereby generating human resources specializing in aerospace for industry or academia. It should be noted that the aerospace industry in Mexico is growing significantly and therefore requires more specialized capabilities. This project is also intended to motivate future generations, strategically disseminating advances in all media impacting industry, academia and government, and so improve relationships with the Japanese space agency, which we know represents an important partner for this growth in Mexico.