

28th IAA SYMPOSIUM ON SMALL SATELLITE MISSIONS (B4)
Interactive Presentations - 28th IAA SYMPOSIUM ON SMALL SATELLITE MISSIONS (IP)

Author: Mr. Rohan Chandra
University of Petroleum and Energy Studies, India, rohanchandra2316@gmail.com

Mr. Monish Mathur
Technische Universität Berlin, Germany, monish.mathur@campus.tu-berlin.de

Mr. Adhithyan Neduncheran
University of L'Aquila, Italy, adhithyan.n@gmail.com

MONITORING FOREST FIRE AND VOLCANIC ERUPTIONS USING SATELLITE
CONSTELLATION

Abstract

Forest Fire and volcanic eruptions are major issues that possess great environmental danger. Though both of them are natural phenomenon but with recent climate change and disrupted earthquake pattern, these phenomena are disturbing the ecological balance. The smoke and volcanic carbon dioxide emitted have a major effect on global warming. It is highly required to monitor the emissions from these phenomena to truly elucidate the major contribution of them to the changes in the synoptic system. The paper proposes a conceptual CubeSat constellation for atmospheric assessment of the region of forest fire and a volcanic eruption. A constellation of six CubeSats is proposed which are launched and will be established in a combination of polar orbits for global coverage and another set of satellites to monitor the mid-latitudes and make more accurate measurements with higher precision and revisit time. The constellation is designed and simulated using Systems Tool Kit software for satellite earth observation. Due to payload constraints on the CubeSat, the sensors subsystem study is reviewed carefully and recent advancement in technologies are proposed such as LIDAR remote sensing so as to obtain precise measurements with less noise. As the CubeSat constellation is implemented, it will serve a higher purpose and help humans tackle many fundamental problems while also addressing the UN Sustainable Development Goals 13 which states to take urgent actions to combat climate change and its impact.