

## EXAMINATION OF INFRASOUND IN THE STRATOSPHERE AND TROPOSPHERE

EXIST

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### ABSTRACT

Low frequency sound can travel thousands of kilometres, and can be used to detect severe weather conditions, meteors, earthquakes, and other interesting phenomena's, all with different applications and areas of research. As of today, most infrasound measurements have been performed at ground and sea level, but those are unlikely to capture the entirety of the infrasound spectrum because of interference from objects on the ground.

Previous airborne measurements have been done in 2014 and 2015 over the southern United States, leaving the question of stratospheric infrasound in the rest of the world open. This provides an opportunity to listen for infrasound above the Arctic Circle in an area with a highly developed network of ground stations, which will be used to compare with the stratospheric results. Infrasound, temperature, pressure, wind velocity and direction will be measured with two independent sensor boxes. All data obtained will be analysed with software used in the International Monitoring System and software developed at the Swedish Institute of Space Physics, with help from Dr. Johan Kero. This will be compared with data from previous measurements in collaboration with Dr. Daniel Bowman, the Student Leader of the High Altitude Student Payload flights in the United States, and Professor Yamamoto, Kochi University of Technology, who will provide the group with microphones developed by SAYA Inc in collaboration with JAXA.

In the future, a deeper understanding of low frequency sounds at stratospheric altitudes may help in examining the weather conditions and geological activity on other planets, especially on Mars as the pressure in the Earth's stratosphere is at the same order of magnitude as the atmospheric pressure close to the surface of Mars.

KEYWORDS: Infrasound, Stratosphere

