3 NITEOWL in the Canadian and International Context

TBD - JJO, MAW

Various efforts have been made to determine profiles of the atmospheric constituents. Canadian missions include the ground-based Stellar Brewer as well as the ODIN and MOPITT satellite projects. The Stellar Brewer project measures the total ozone column from atmospheric absorption of solar ultraviolet radiation using four channels from 310-320 nm. They plan to extend the operation of this instrument to include a stellar source in order to monitor ozone in the high Arctic during the polar night. The commitment to furthering the understanding of ozone trends is shown by the Canadian involvement in missions such as ODIN and MOPITT.

Onboard Nimbus 7, the TOMS instrument provided nearly fifteen years of reliable, global ozone maps. This coverage is still being provided today by other TOMS instruments which highlights the international interest in monitoring global ozone trends. Unlike TOMS, which uses individual spectral signatures to measure ozone, HALOE identifies absorption features within selected spectral bands through a solar occultation technique. HALOE is another instrument which is aimed to obtain . All of these missions exclude the polar night.

In order to provide ozone coverage during the polar night, the GOMOS project was initiated. GOMOS will perform stellar occultation measurements to study ozone, similar to the NiteOwl project, but at a much higher cost which may partially be attributed to the number of targeted species and the necessary spectral resolution. In an attempt to reduce costs while still realizing similar GOMOS science objectives, the COALA study is intended to make complementary nighttime or validation measurements for other missions. Although the NiteOwl objectives also include nighttime ozone retrieval, we plan to provide similar science results at a reduced cost from a Canadian perspective.

It is our intention to provide a Canadian polar night ozone measurement by tomographic technique. A key element for quality tomographic results is redundant measurements. These would be of the same atmospheric cell taken from different vantage points during descent and improved by multiple lines-of-sight provided by the various stars in our field of view. Presently, this is accomplished by making observations over multiple passes of the same area. Our technique is to have the payload rotate as it descends, thereby getting multiple looks through the same cells, each from a different angle. This allows the required redundancy to be achieved in one pass. In addition, the broad ozone absorption feature of the Chappuis band (450 - 750 nm) does not place heavy restraints on the spectral resolution of our instrument. This may affect the number of recoverable species but will reduce the cost of the mission.

4 Required Theoretical and Modelling Support

TBD - JAS, MAW

5 Required Support Measurements

TBD - MAW, MH

6 Data Analysis and Publication Plan

TBD - JAS, MAW with input from ATD, DPS, and others

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