Preliminary Results from LITES and Model Comparison

George Geddes[1], Susanna Finn[1], Tim Cook[1], Supriya Chakrabarti[1], Andrew Stephan[2], Scott A. Budzien[2]
[1]University of Massachusetts Lowell, [2]U.S. Naval Research Laboratory
george_geddes@student.uml.edu

LITES

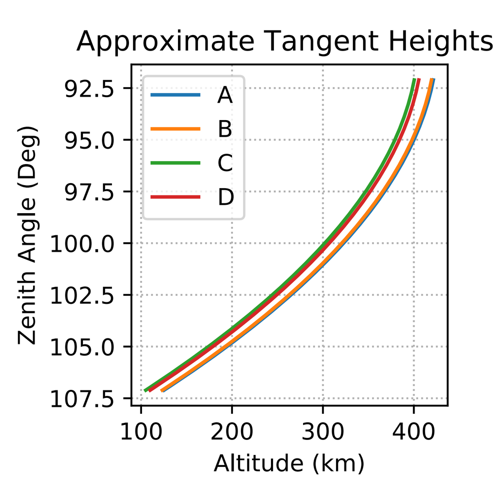
The Limb-Imaging Thermospheric Extreme-ultraviolet Spectrograph(LITES) launched on February 19, 2017 and was mounted on the International Space Station (ISS). "First light" was collected on March 6 and early orbit checkout was completed on April 4. LITES will operate continuously in day and night conditions for the duration of the STP-H5 mission lifetime, whihc is a minimum of two years. LITES is sensitive to UV emissions from approximately 600-1400 Å and images the limb from 100-400 km continuously during the night and day. Calibration of data is underway and with new data coming in every day, collaboration is very welcome!

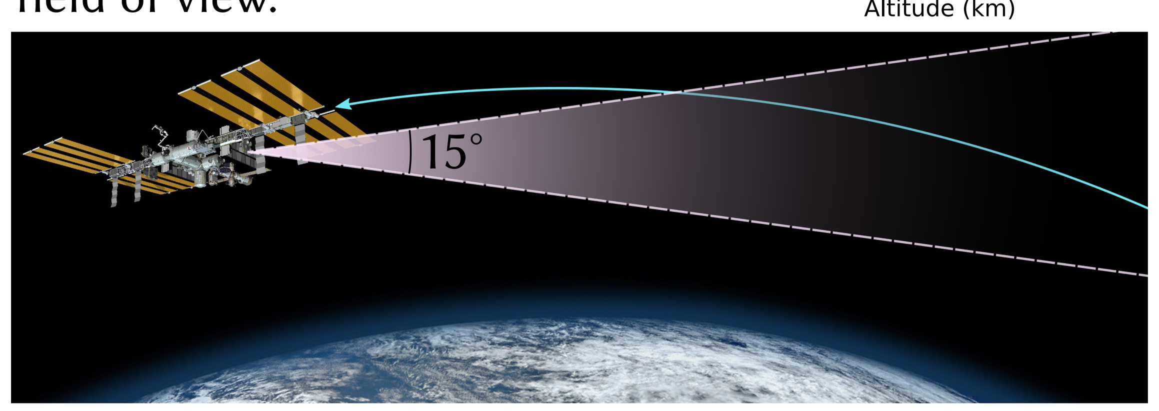
Flight Data

The data presented in this poster have not been calibrated or background-subtracted, but simply scaled to fit model predictions. This gives an idea of LITES' sensitivity and spectral range, although many more features than the three presented here are available.

Limb-Viewing Geometry

LITES looks aft of the ISS through the limb of the thermosphere. It has a 15° field of view in the vertical direction and a 10° horizontal field of view.





Acknowledgements
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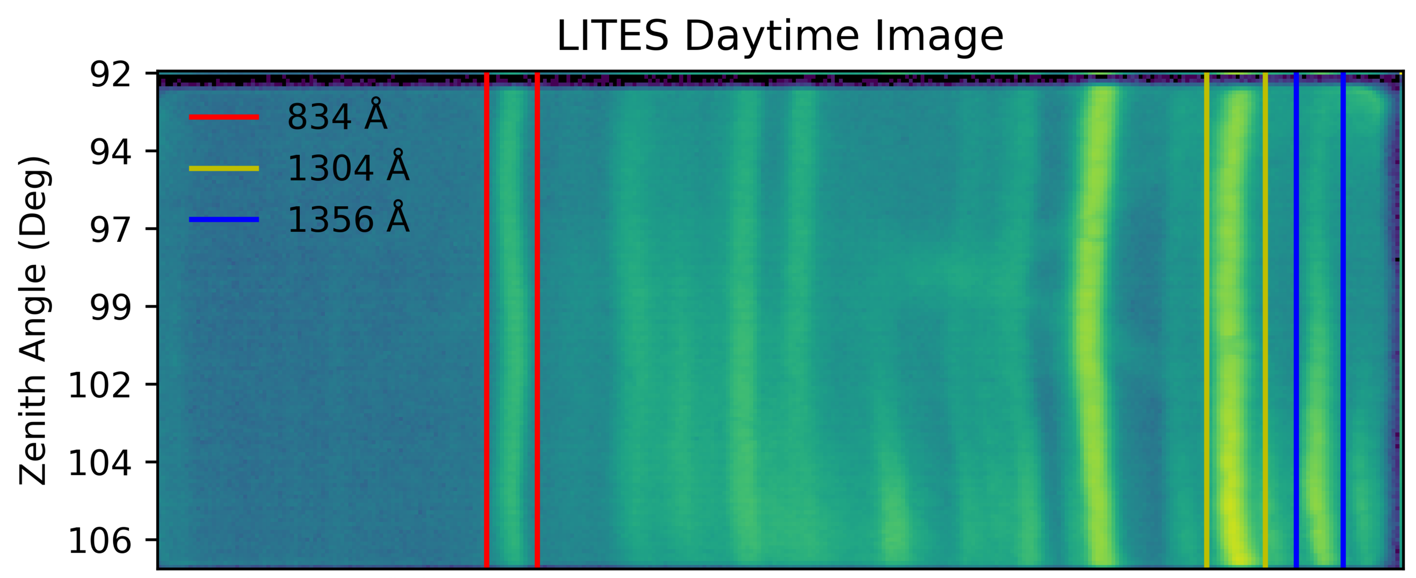
References

[1] Hubert, B., Gérard, J. C., Cotton, D. M., Bisikalo, D. V., & Shematovich, V. I. (1999). Effect of hot oxygen on thermospheric OI UV airglow. Journal of Geophysical Research: Space Physics, 104(A8), 17139-17143.



Limb Profile Data

Since calibration is not yet available, LITES limb profiles are scaled and plotted next to an AURIC prediction for OI 1304 Å, OI 1356 Å, and OII 834 Å at four points along an orbit on April 5th, 2017, with conditions summarized in Table 1. Each limb profile is integrated over a 30 second period by combining ten three-second exposures. Scaling is determined by a least squares fit to the model at low altitude. Error bars represent 1σ uncertainty in photon count. The OII 834 Å intensity does not fit the model prediction in any case. This may suggest a different [O^+] profile than predicted by the model.

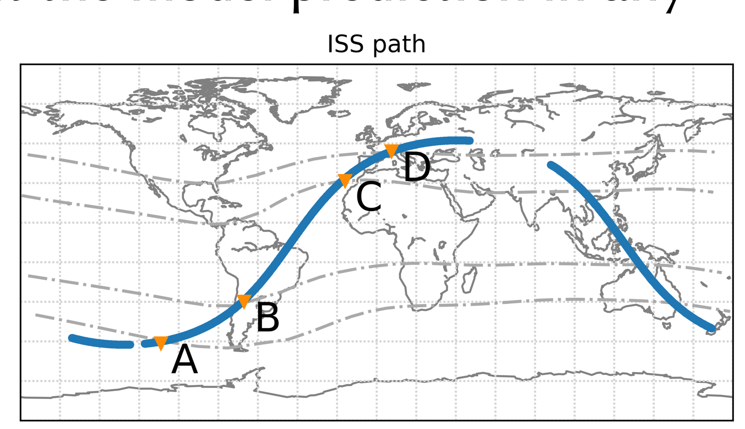


Table 1: Geophysical Parameters for April 5, 2017

Label	MLAT	MLON	SLT	SZA	Ap	$F_{10.7}$
A	-40°	340°	15.0	68.7°	8	84.7
B	-20°	360°	12.1	35.5°	8	84.7
C	20°	60°	8.3	57.2°	8	84.7
D	40°	80°	6.7	78.4°	8	84.7

Hot Oxygen?

Both OI 1304 Å and OI 1356 Å show a significant increase in intensity at high altitude compared to the model prediction. The excess intensity in both of these features suggests a possible superthermal population of atomic O at high altitudes [1]. It is also possible that the modled neutral density or temperature profiles are incorrect, or that there is a recombination contribution not accounted for in the model, or some combination of these. A calibration is necessary to proceed in any case.