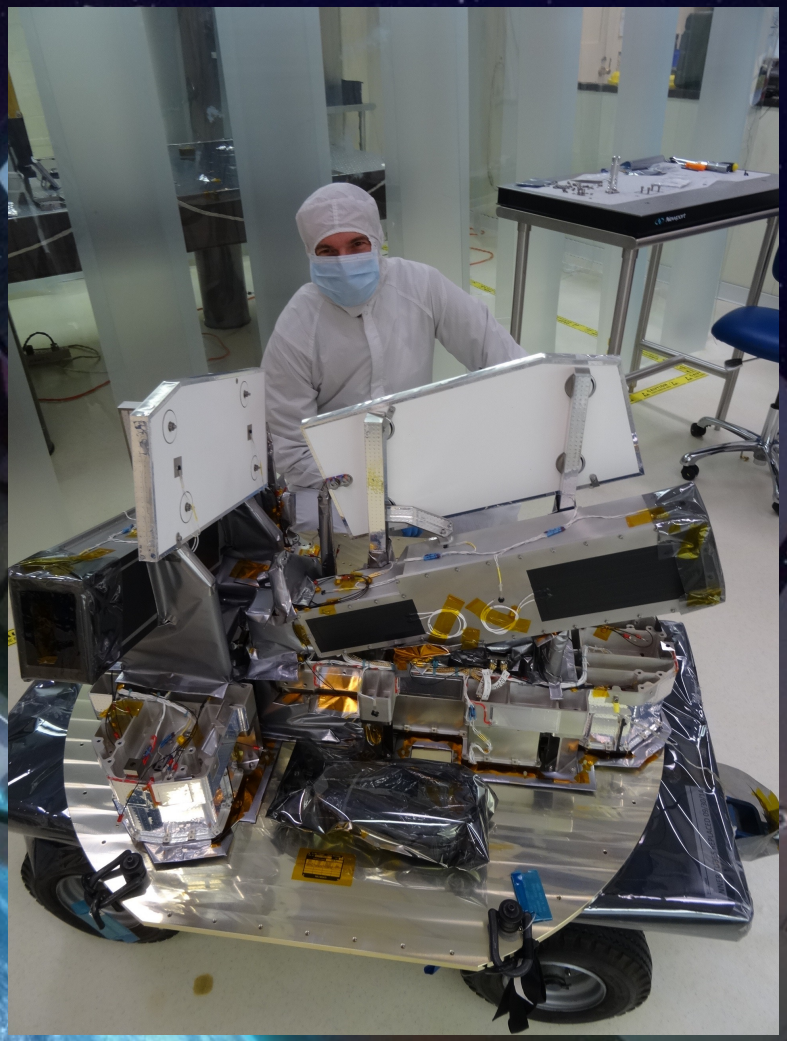
The MIGHTI Instrument

Ionospheric Connection Explorer

MIGHTI measures
- horizontal wind vector profiles
- lower thermospheric temperature

It uses the Doppler shift of the oxygen red (630.0nm) and green (557.7nm) lines to measure the wind and the spectral shape of the oxygen A-band (~762nm) to measure temperature.



MIGHTI consists of two identical sensor units, MIGHTI A and MIGHTI B

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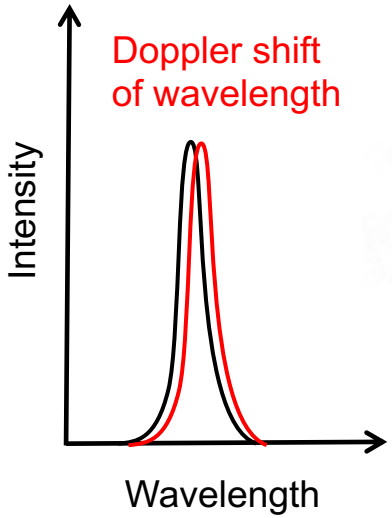
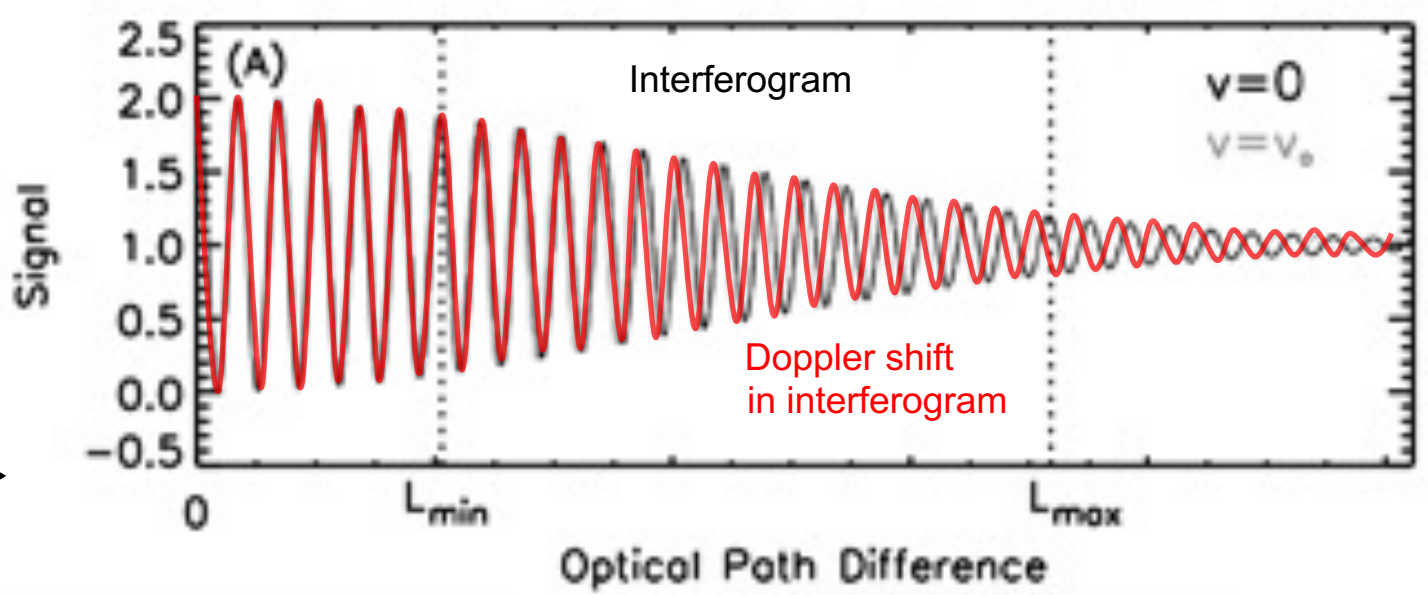
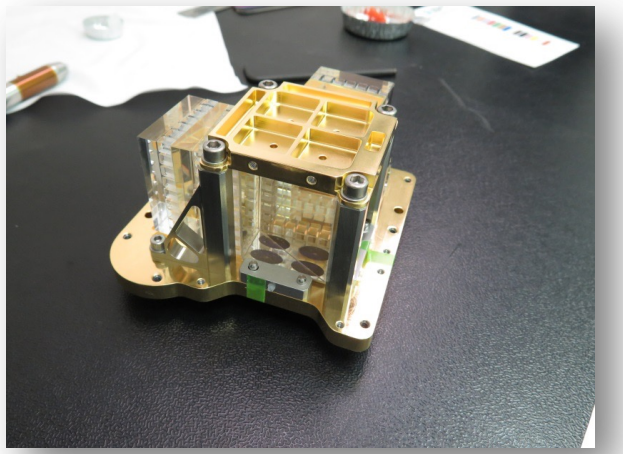
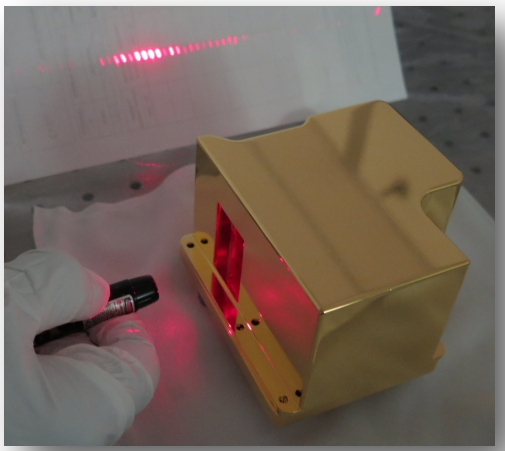
DASH (Doppler Asymmetric Spatial Heterodyne) Spectroscopy is Similar to SHS and the WINDII Technique





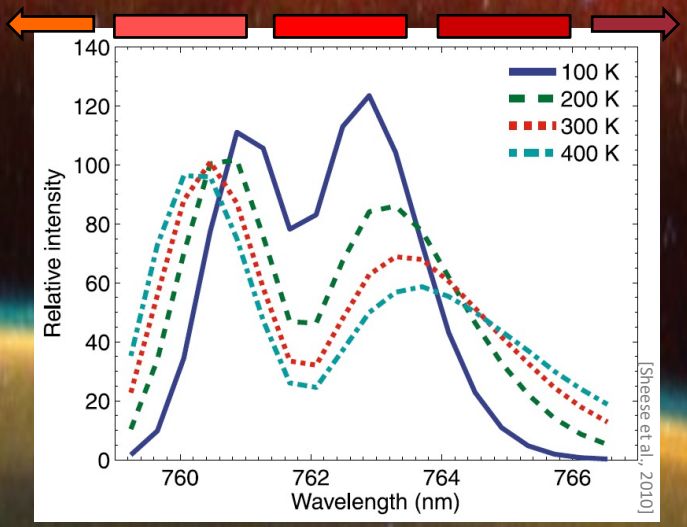




Multispectral imager to measure temperature: Similar to OSIRIS and RAIDS

Ionospheric Connection Explorer

- The shape of the bright molecular oxygen A band emission feature is a function of temperature.
- Three filter channels on the band are used to get temperature and common filter drift information.
- Two off-band filters are used to determine the background (baseline).



NASA false color image

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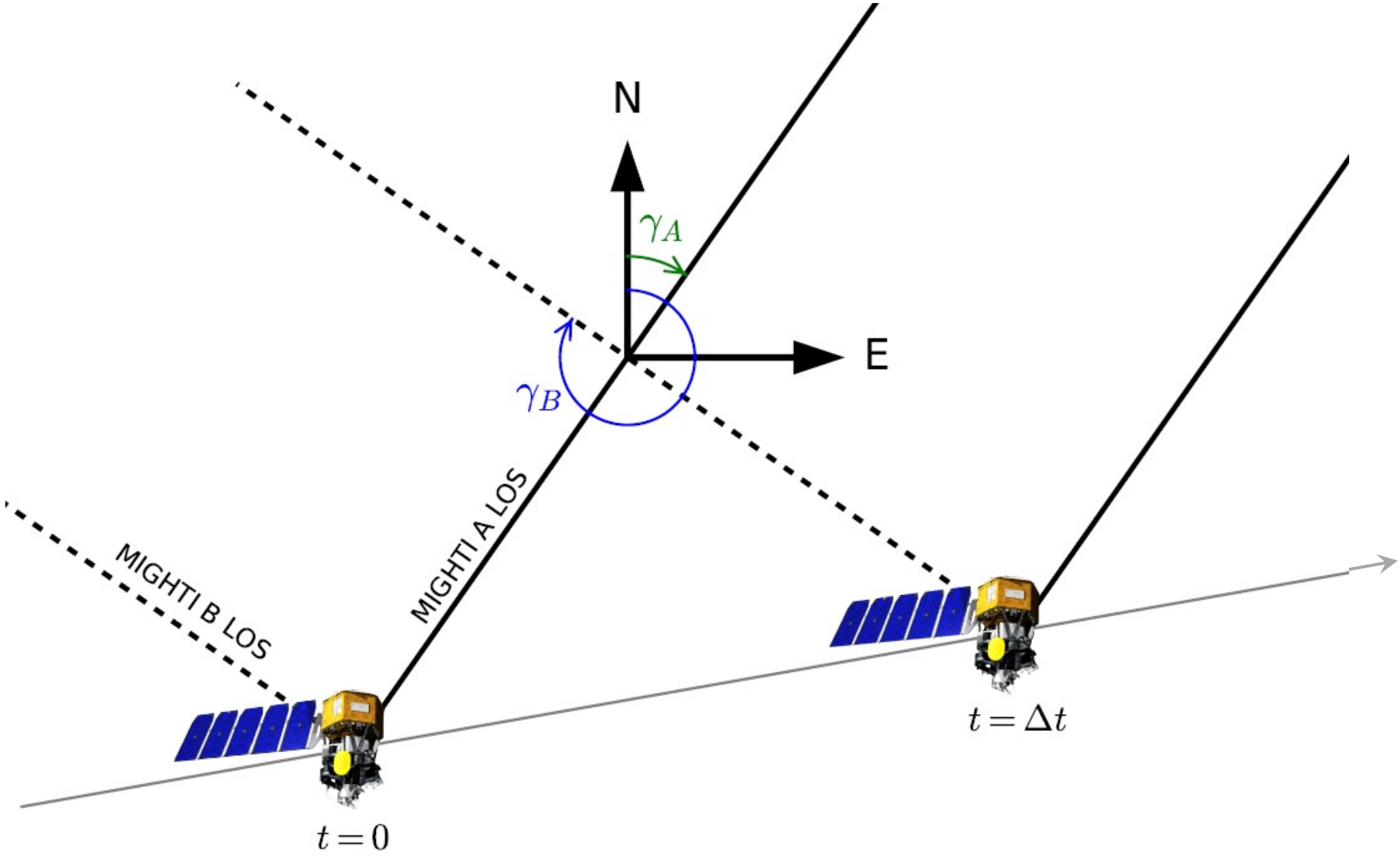
Measurement Geometry



MIGHTI Sensor Images

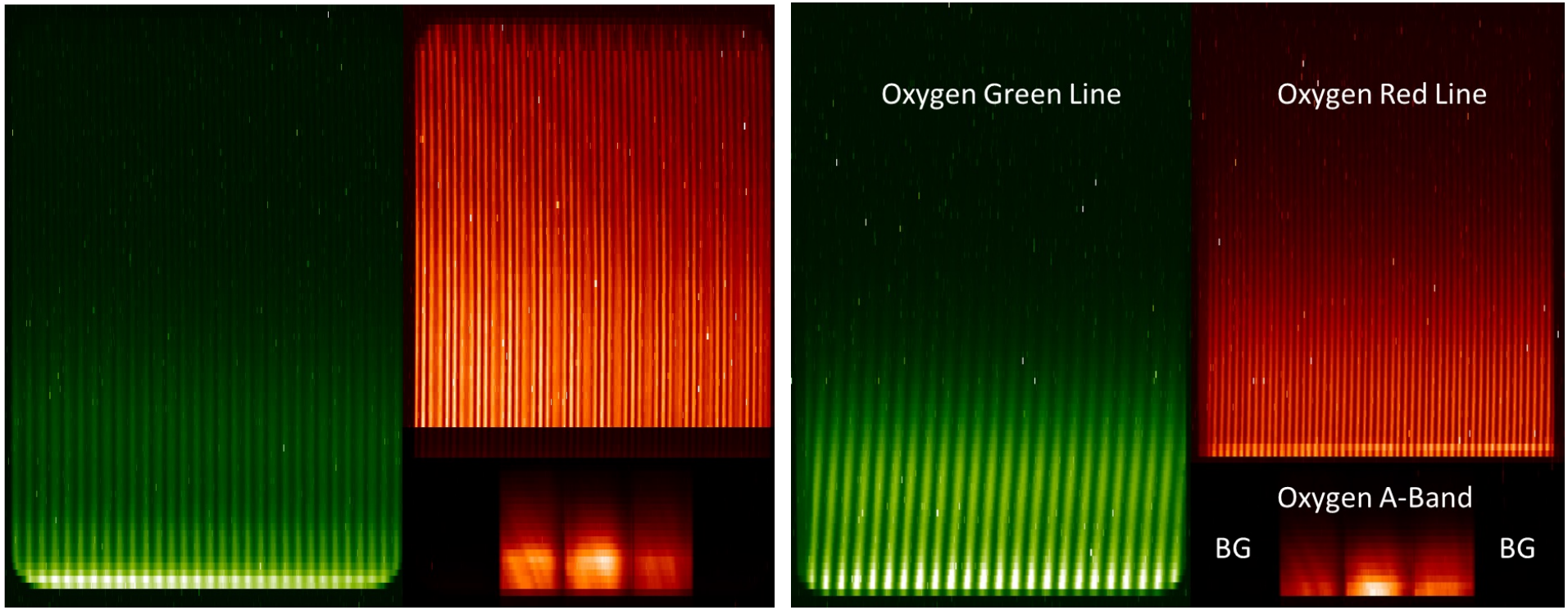
ICON
Ionospheric Connection Explorer

MIGHTI-A

With Calibration Lamp Signal

MIGHTI-B

Altitude (90-300km), 2.5km sampling



All altitudes are sampled at the same time (no scanning)

Every tangent altitude is measured by a "different instrument"

Doppler shift from v=100m/s causes phase shift of ~1/400 fringe

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Acknowledgement

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