

An Integrated Web-based Visualization System for Monitoring and Validation of the Products from Hyper-spectral Instruments



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Introduction

As a hub for the hyper-spectral sounding activities, NOAA NESDIS STAR is producing more and more high quality products from advanced infrared sounders and microwave sensors. A very important part of the data processing is the monitoring of the instruments performance and the quality of the products. NOAA NESDIS STAR has developed a website for displaying and monitoring various types of hyper-spectral products, including radiances, retrieved geophysical parameters, as well as the trace gas products. The website allows us to bring the look and feel of the hyper-spectral observations to the users; continuous monitoring of the hyper-spectral instruments, such as AIRS, IASI, and CrIS; and support of the verification and validation efforts of the sounding products from the different satellite platforms.



Sounding Products:

Core Products	Trace Gas & Research Products
Infrared Radiances	Ozone Profiles
Cloud Cleared Radiances	CO
Atmospheric Temperature Profiles	CH ₄
Atmospheric Moisture Profiles	CO ₂
Cloud Top Temperature, Pressure	SO ₂ , HNO ₃ , N ₂ O
Surface Temperature, Emissivity, ...	Atmospheric Instabilities, ...

and more to come...

Main functions of the website include:

- Alarms (SO₂/volcanic eruptions)
- Quality Assurance
- Validation of products
- Error Assessment

Data Sets:

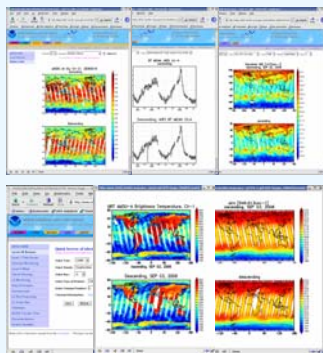
Global Grids: Daily Monitoring

- 0.5 deg lon x 2 deg lat (Daily Monitoring)
- 3 deg lon x 3 deg lat (Reprocessing capability)

Near Real Time:

Granule based monitoring

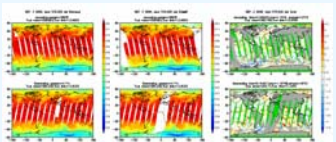
Core Products



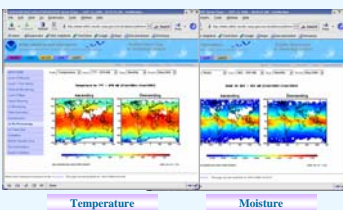
Radiance Products can be displayed for selected instruments (AIRS, AIRS co-located MODIS, IASI, AMSU...), date, and channels. The performance of the instruments are also monitored using the Principal Component Analysis (PCA) technique.



Retrieval Products: Retrieved temperature (from regression and physical retrieval) can be displayed, comparisons with ECMWF data are also available.



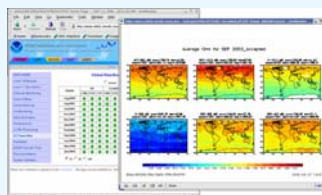
Reprocessed retrieval products using the best and latest algorithms are also available.



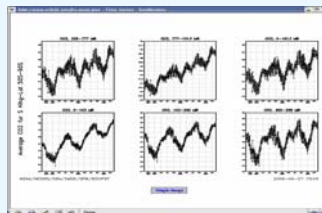
Trace Gas Products

Trace Gas products can be browsed as a function of geography, time... Variations with time and geography are also being monitored.

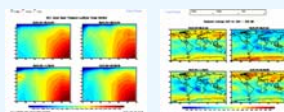
Monthly Average for different layers



CO₂: Time Series

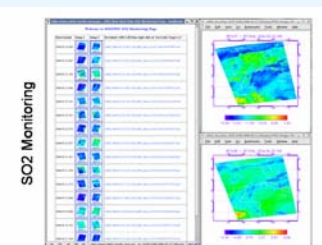


Trace Gas: Transport Trace Gas: Seasonal Average



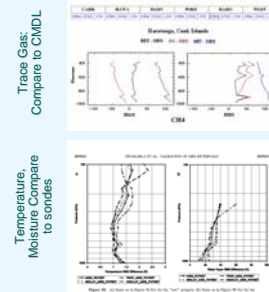
SO₂ Monitoring

- Developing the capability to provide near-real time SO₂ detection
- Email message sent out automatically to the users when the possible so₂ signals detected
- Granule plots and data are available from the website.



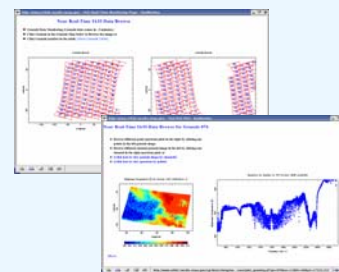
Products Validation

- Validation of products versus operational sonde networks
- Temperature
- Humidity
- Ozone
- Validation and Evaluation of Trace Gas Products



Near Real Time capabilities:

- View the most recent IASI data that has been processed.
- Select the granule that is interesting
- Click on any spot will bring up the full spectra
- Click on interesting spectrum brings up the corresponding granule map
- Similar features are under development for level 2 products and match-ups



For more information about the NRT processing system: please see poster

"Distribution of Hyperspectral Radiances to Numerical Weather Prediction Centers" (Walter Wolf et al.)

Visit our website:

<http://www.orbit.nesdis.noaa.gov/smcd/spb/iosspdt/testd1/iosspdt.php>

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Cooperative Institute for Meteorological Satellite Studies, 2006.