

Why you need McIDAS-V

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Introduction

- What is McIDAS-V?
- Why I want it?
- Why you will want it!



What is McIDAS-V

McIDAS-X → VisAD + IDV + HYDRA = McIDAS-V





VisAD

Developer: Bill Hibbard, UW SSEC



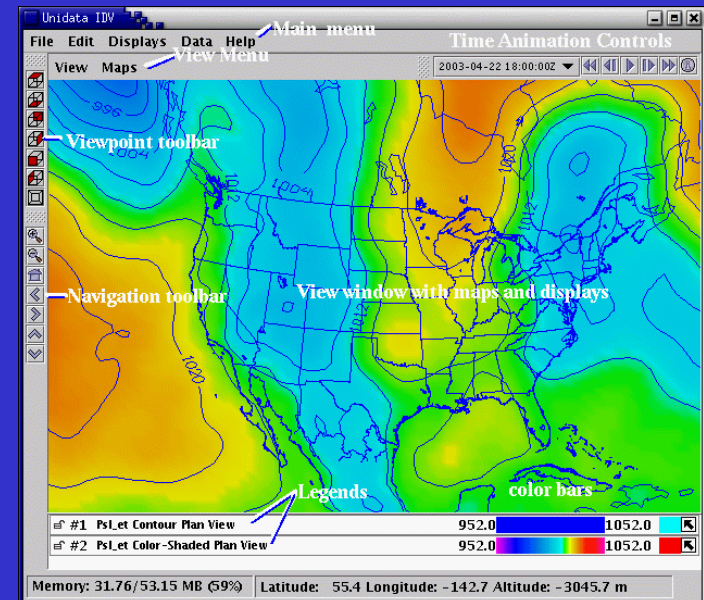
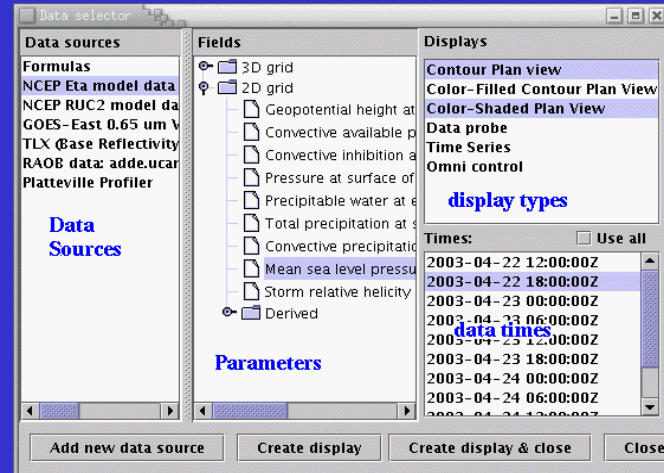
- Open-source, Java library for building interactive and collaborative visualization and analysis tools
- Features include:
 - Powerful mathematical data model that embraces virtually any numerical data set
 - General display model that supports 2- and 3-D displays, multiple data views, direct manipulation
 - Adapters for multiple data formats (netCDF, HDF-5, FITS, HDF-EOS, McIDAS, Vis5D, etc.) and access to remote data servers through HTTP, FTP, DODS/OPeNDAP, and OpenADDE protocols
 - Metadata can be integrated into each data object



What is the IDV?



- Unidata developed, VisAD-based, scientific analysis and visualization library and toolkit
- Open Source, Java™ framework and reference application
- Provides 2- and 3-D displays of geo-scientific data (plus, of course, animations)
- Stand-alone or networked application



<http://www.unidata.ucar.edu/idv>



What is the HYDRA?



- HYperspectral-view for Development of Research Applications
- Open Source, Java™ framework
- Used in research to visualize, analyze and combine satellite data and products
- Stand-alone or networked application
- Used as an international satellite remote sensing training tool



<http://www.ssec.wisc.edu/hydra/>

HYDRA enables interrogation of multispectral and hyperspectral fields of data

- Individual pixel location and spectral band measurements can be easily displayed**
- spectral channels can be combined in linear functions and the resulting images displayed**
- false color images can be constructed from multiple channel combinations**
- scatter plots of spectral channel combinations can be viewed**
- pixels in images can be found in scatter plots and vice versa**
- transects of measurements can be displayed**
- L2 products; e.g. soundings of temperature and moisture as well as spectra from selected pixels can be compared**
- integrated data exploration and analysis between GEO and POLAR observing platforms**



McIDAS-V Functionality



McIDAS-V will be a collection of software tools, and networked services and data designed to take advantage of a scalable distributed computing environment to meet user needs

- McIDAS-X
- OPeNDAP / OpenADDE
- Open GIS Consortium
- Database archives
- Cluster computing



Why I want McIDAS-V

- Education
- Research
- Presentations

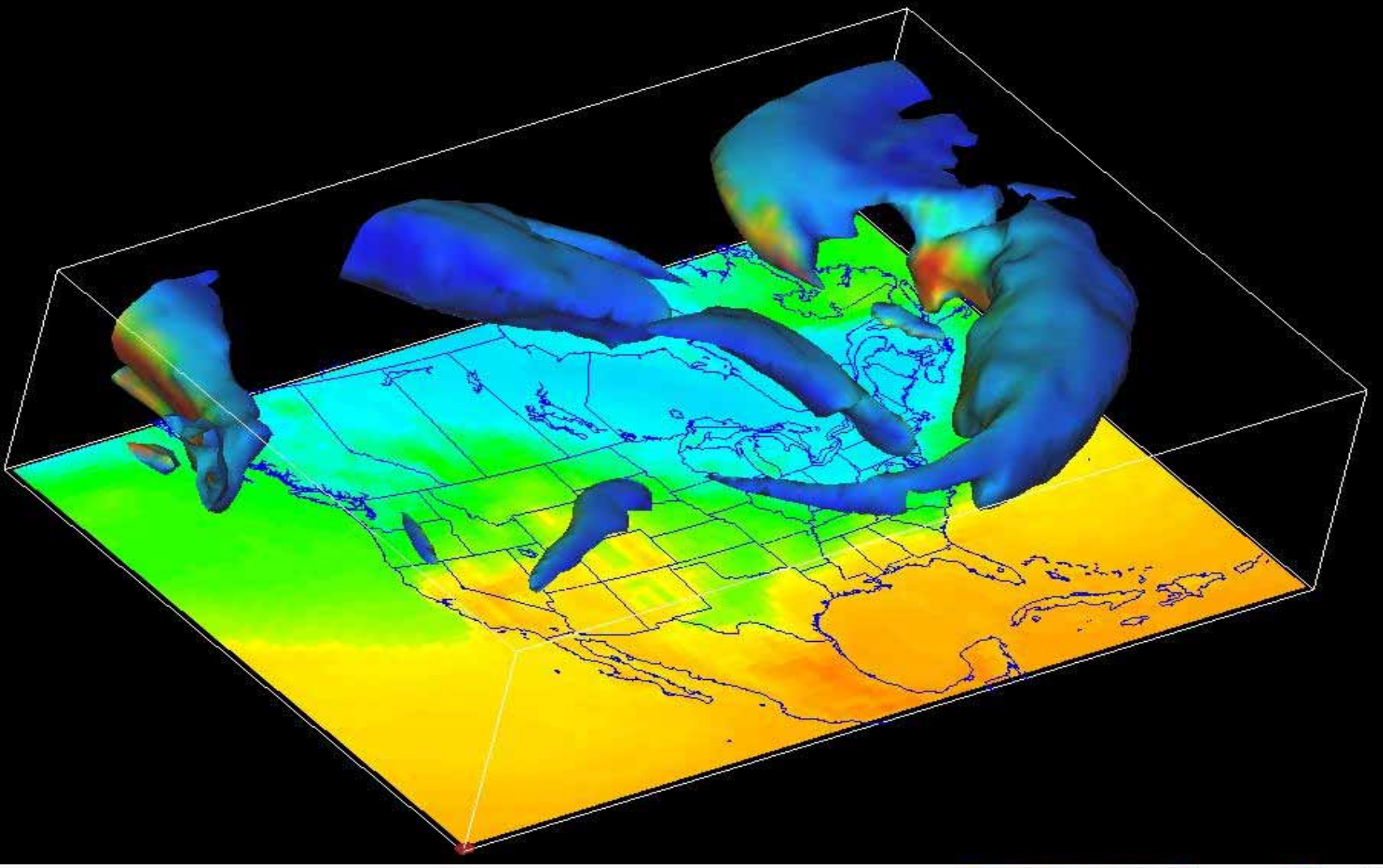
Why I want McIDAS-V

- Education
 - Ease of use
 - 3-D interaction and overlays
 - Batch processing
 - Free software
- Research
- Presentations



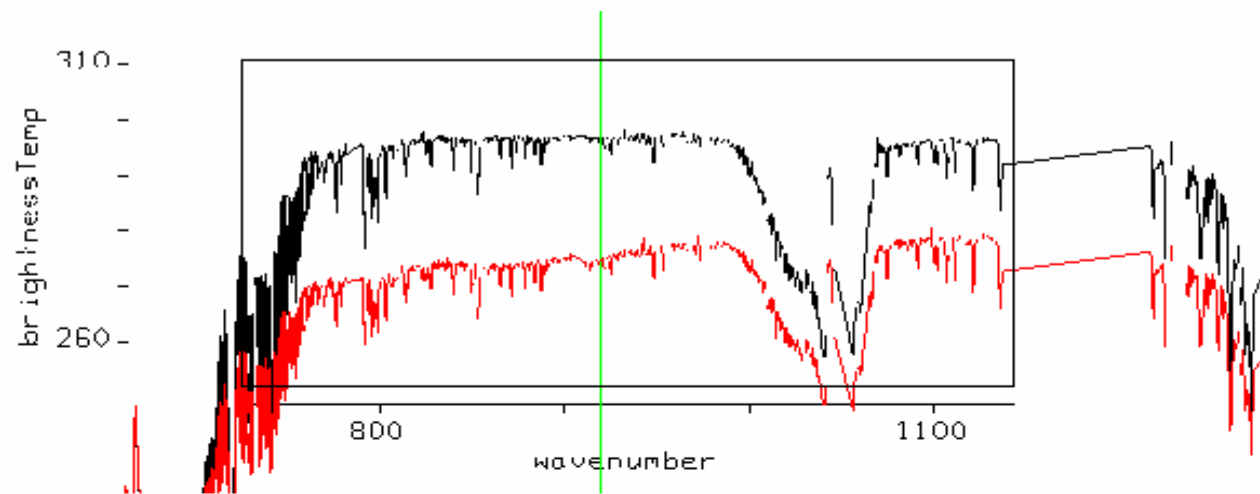
View Projections

2005-11-23 00:00:00Z

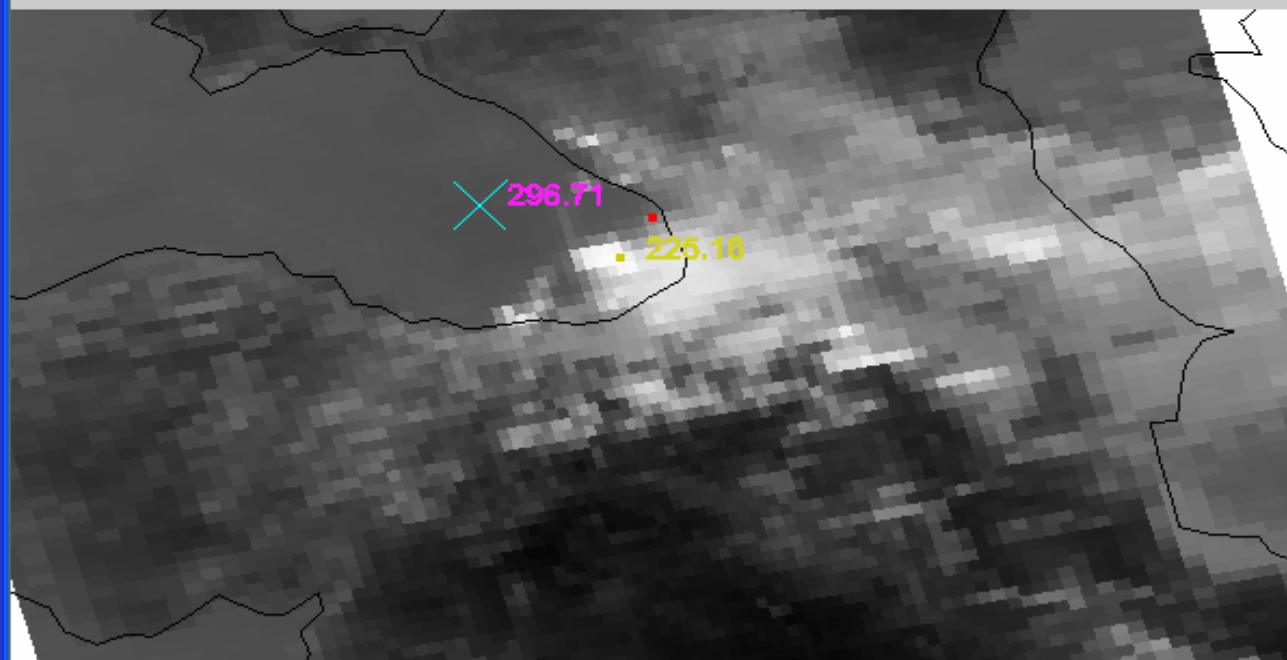


- #1 Temperature at isob... - Color-Shaded Plan View; Level: 1000 hectopascals -90 45 celsius
- #2 Windspeed (from Gri... - Isosurface colored by another parameter; Value: 49.2 m/s -100 200 1E-6 s-1
- #3 Background Maps: World Country Outlines: North & Central America

Memory: 80.24/118.59 MB (67%) Latitude: 41.2 Longitude: -96.1 Altitude: -13302.9 m



wavenumber 919.47 cm⁻¹



Instrument: AIRS

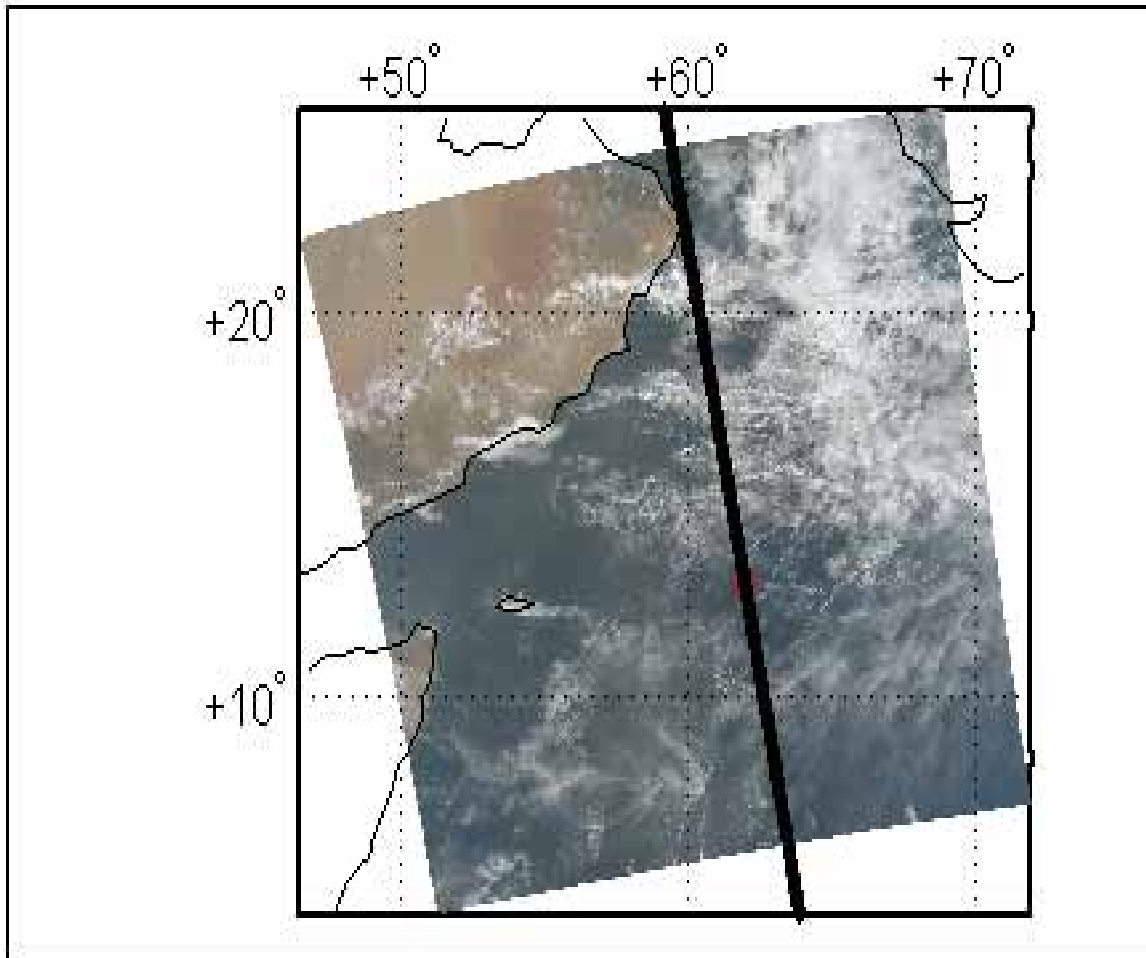
Lat = 42.604 Lon = 41.110



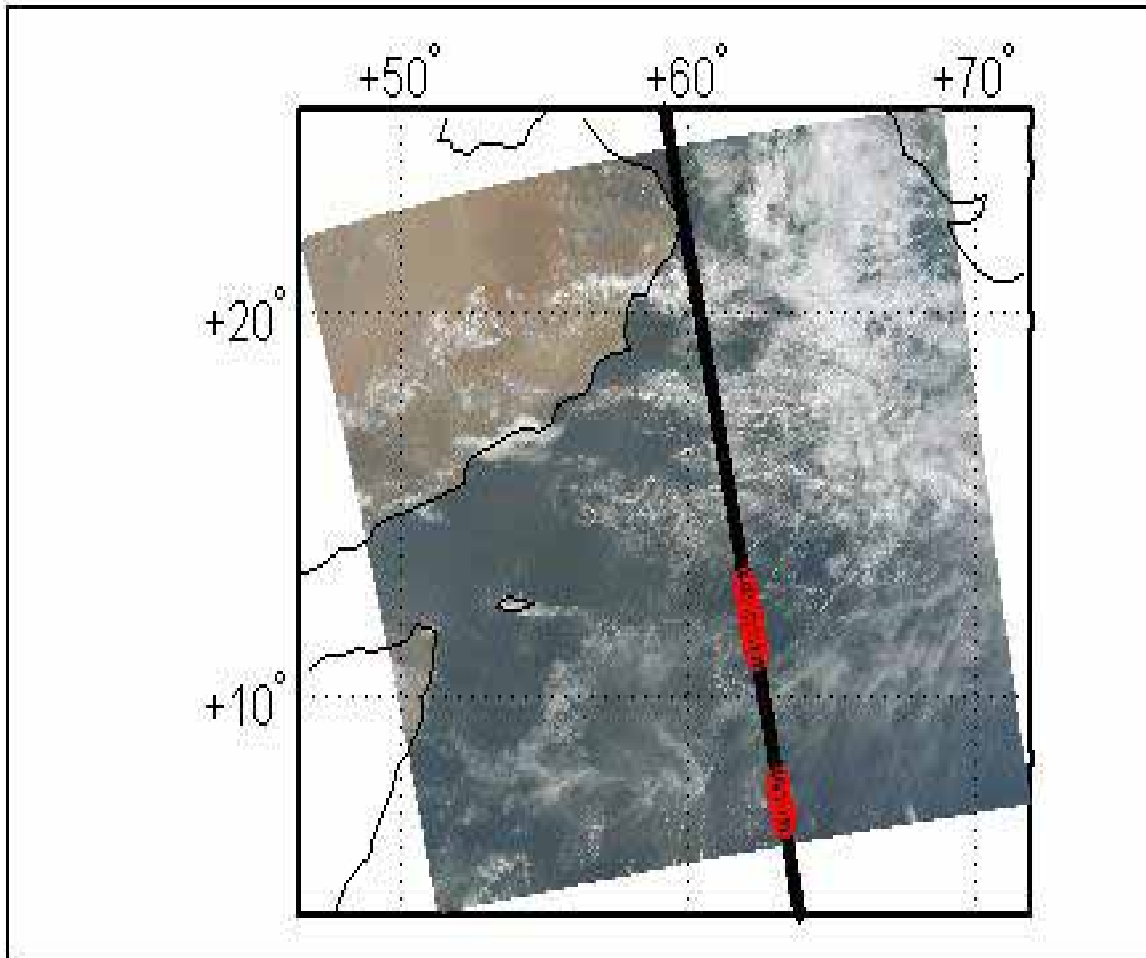
AIRS Cirrus vs Clear Sky Spectra

Why I want McIDAS-V

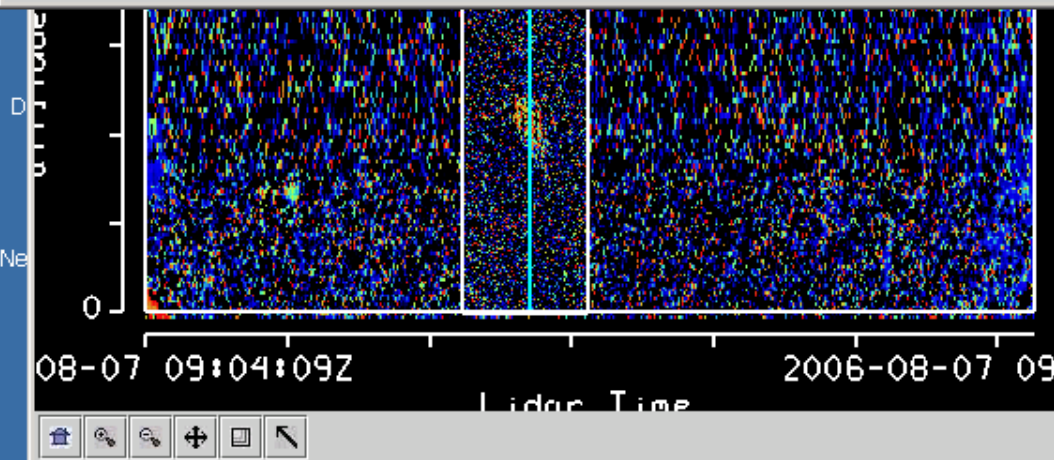
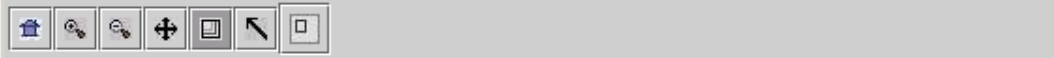
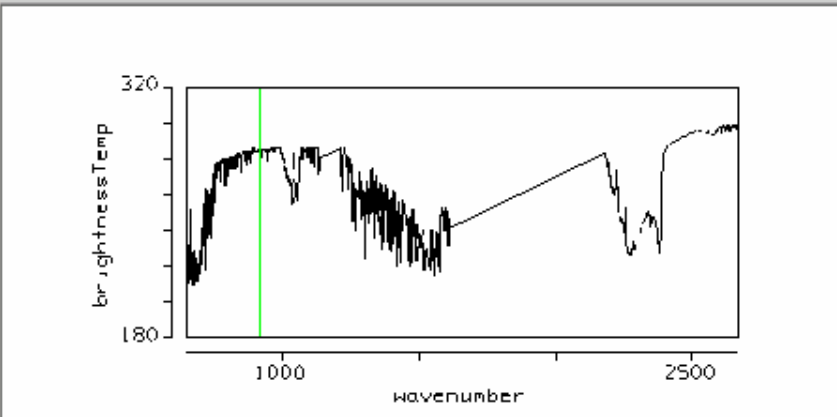
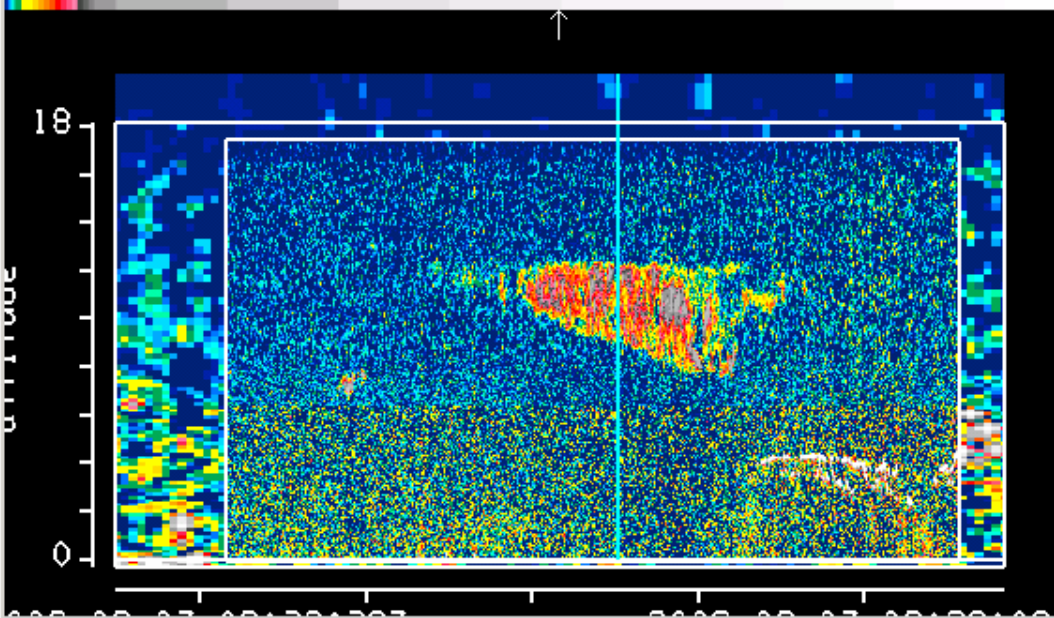
- Education
- Research
 - New data sets easy to handle
 - Quick data analysis and visualization
 - Batch processing
 - Programming capability
- Presentations



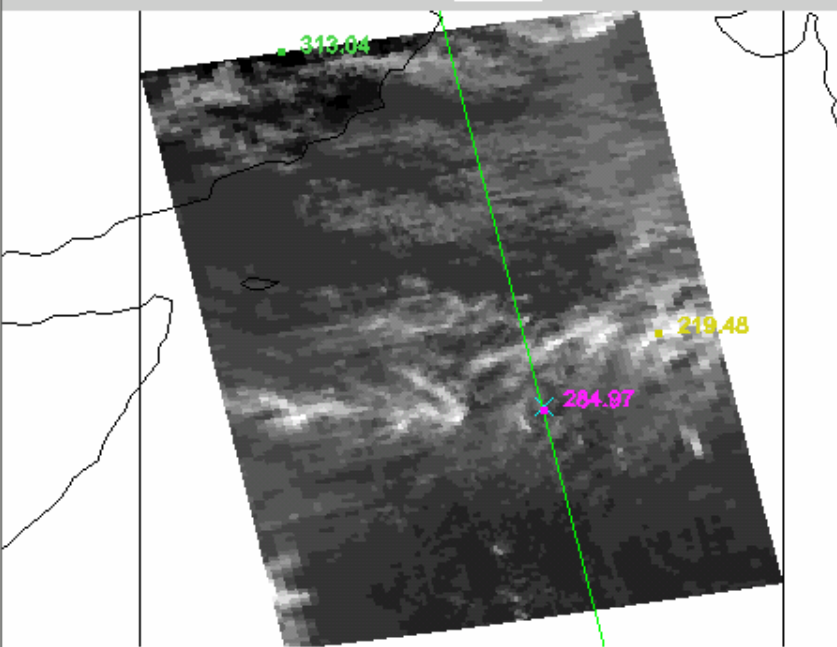
**AIRS
MODIS
CALIOP
Cirrus
study**



**AIRS
MODIS
CALIOP
Cirrus
study**



wavenumber 919.47 cm⁻¹

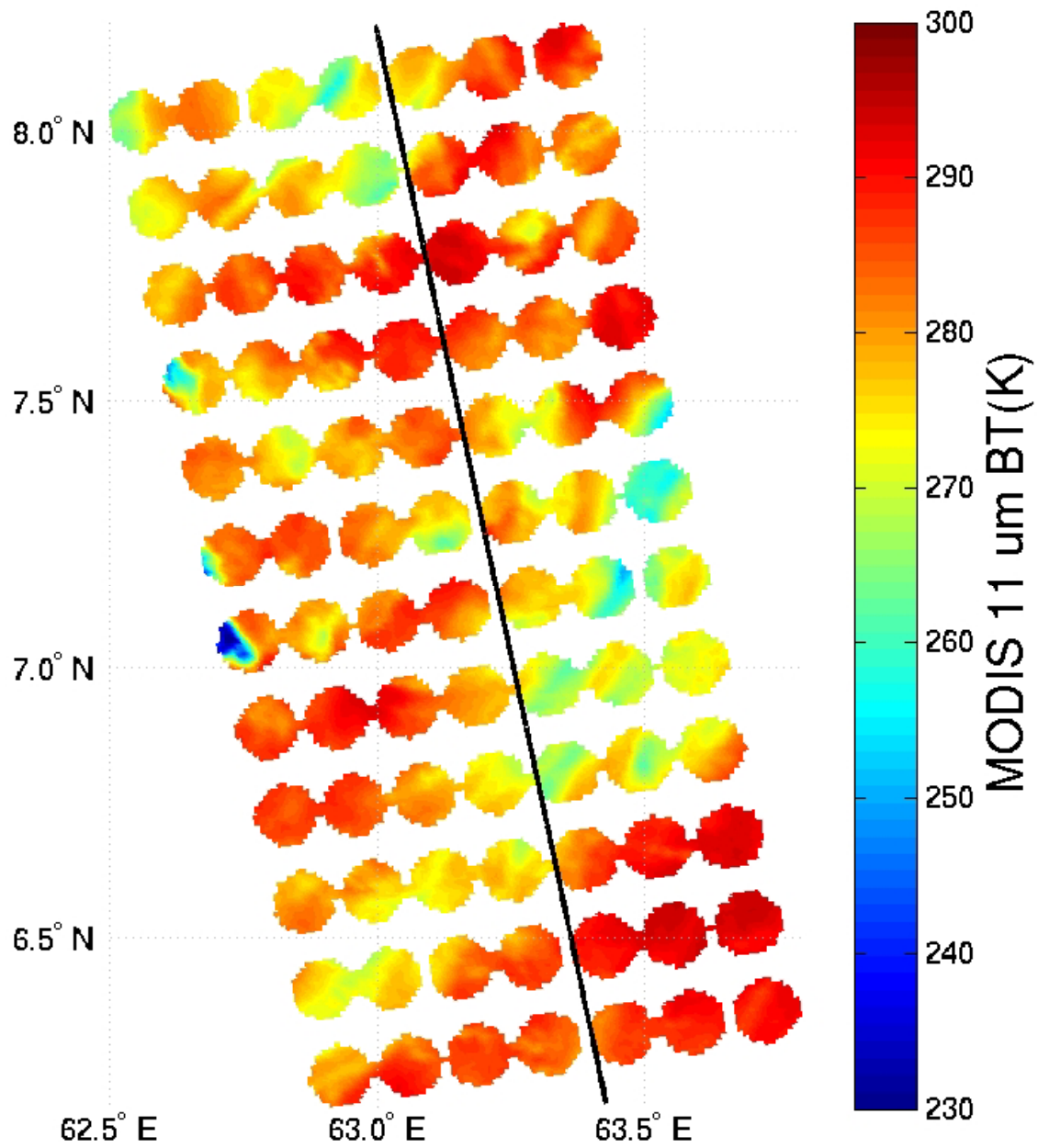


Instrument: AIRS

Lat = 7.939 Lon = 63.116

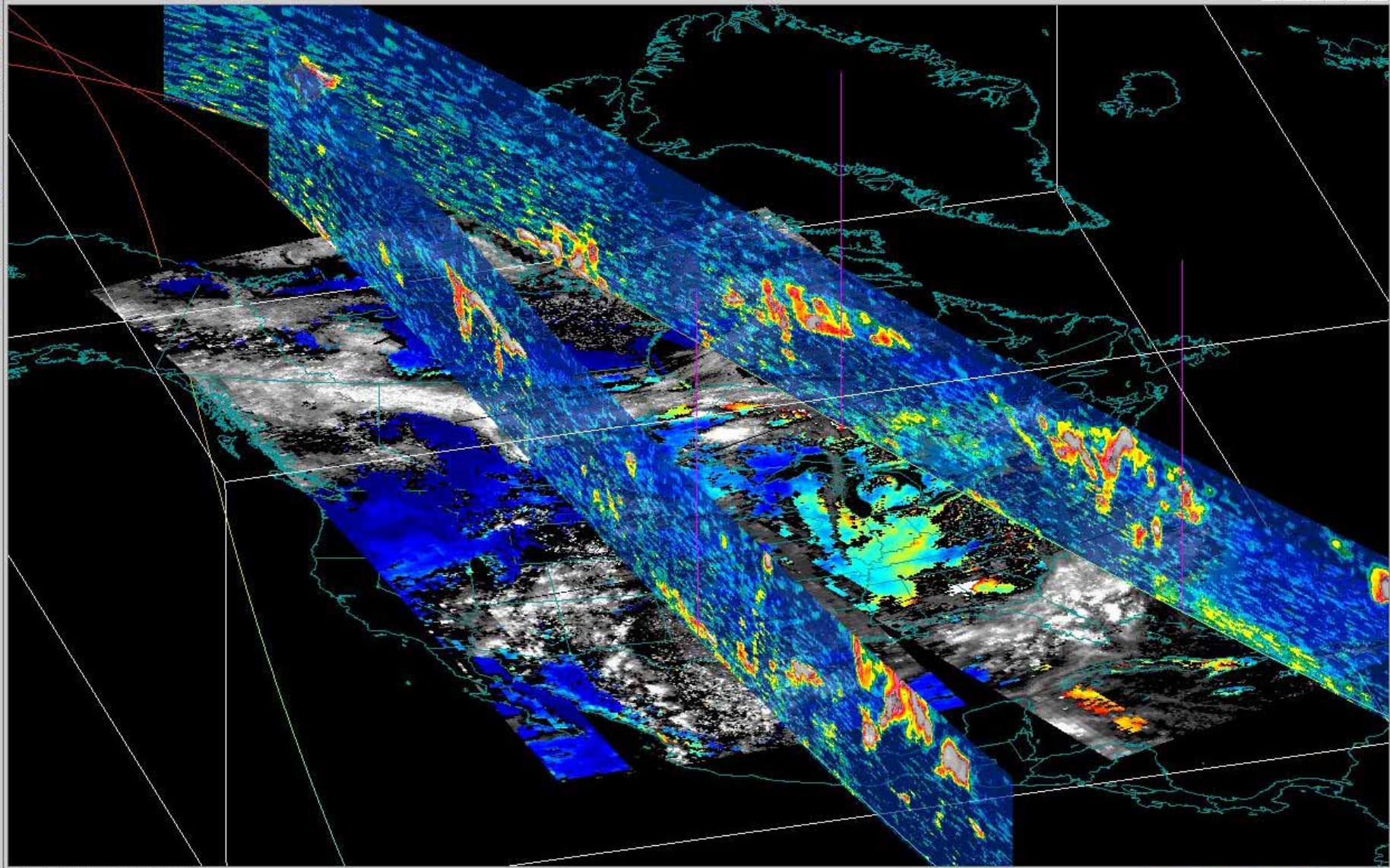


MODIS 11 μm BT





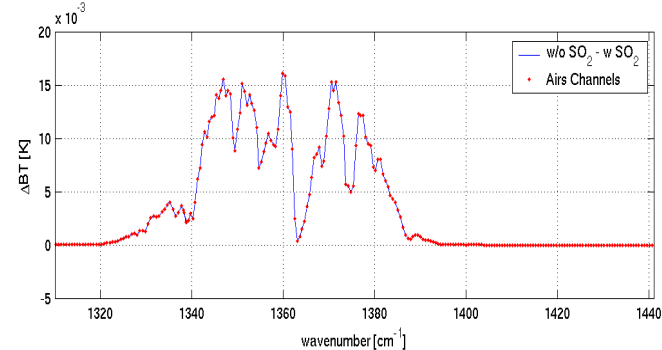
View Projections



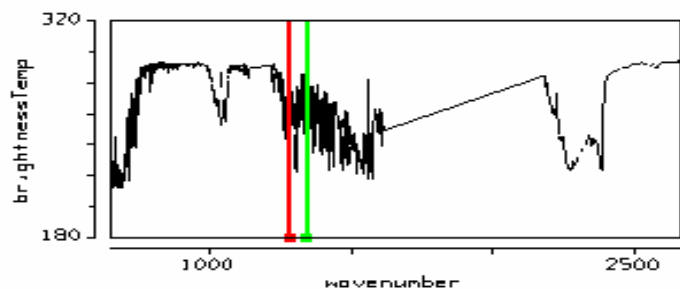
- #6 MOD04.L00 - Image Display
- #7 MOD06.COT - Image Display
- #8 MOD06.COT - Image Display



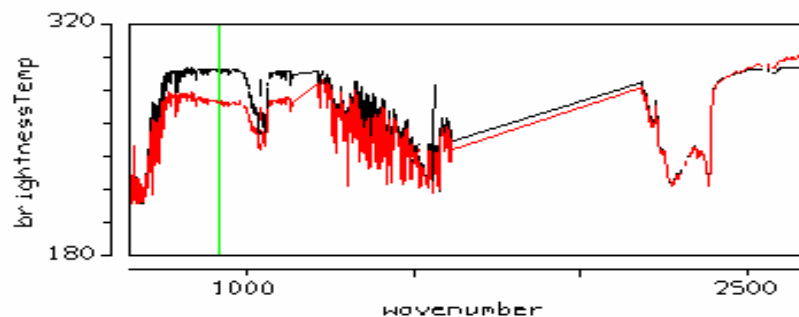
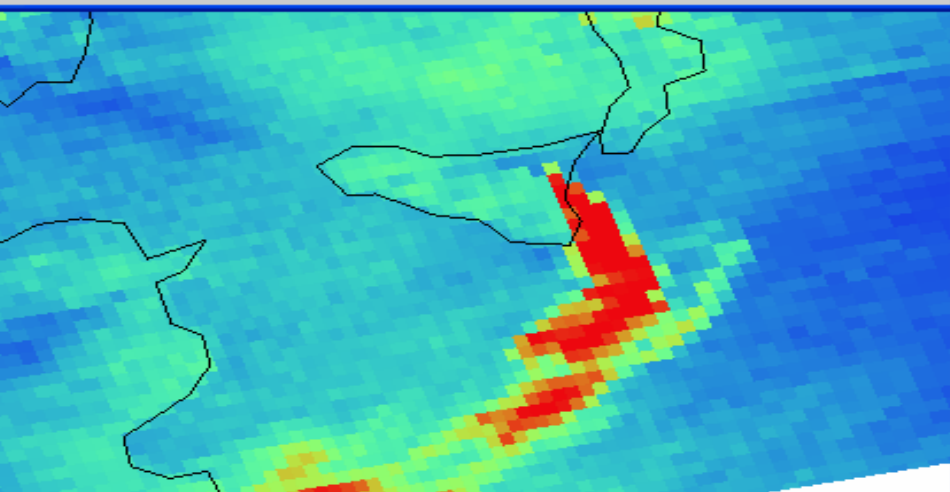
Mt Etna viewed by AIRS 28 Oct 2002



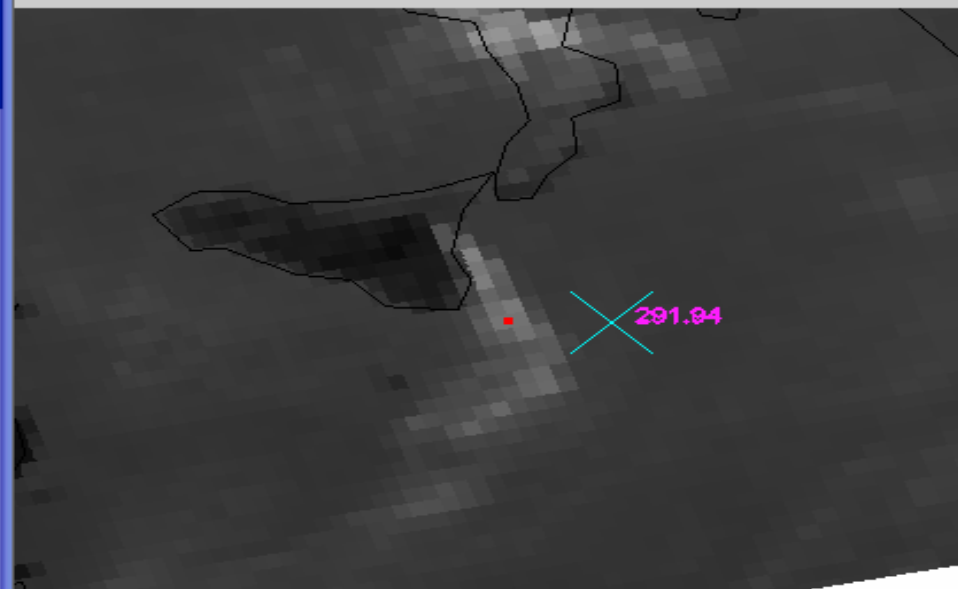
SO2 signal 1284-1345 cm-1



(1.0 1284.348 - 1.0 1344.799)



wavenumber 919.47 cm^-1



Why I want McIDAS-V

- Education
- Research
- Presentations
 - Publication quality images

Live Presentation

The screenshot displays a Windows desktop environment with a blue background. The taskbar at the bottom shows the Start button, system tray with the time 5:48 AM, and several open applications: 2 M..., CALI..., 3 N..., run ..., 3 j..., Jasc..., and 100% zoom. The desktop has icons for folders (rsync backups), NoteTab Pro, SecureCRT 4.0, Mozilla Firefox, Palm Desktop, directions..., and wilma.mov. Two windows are open: 'lidar viewer' and 'channel viewer'. 'lidar viewer' displays a colorful lidar scan of a landscape with a white arrow pointing up. 'channel viewer' shows a spectral plot of brightness temperature vs wavelength, a map of a region with a green line and two data points (271.12 and 216.29), and instrument information (MODIS) and coordinates (Lat = -62.879, Lon = -93.312).

Why you want McIDAS-V

- Training (Education)
- Weather System Analysis (Research)
- Presentations (Presentation)

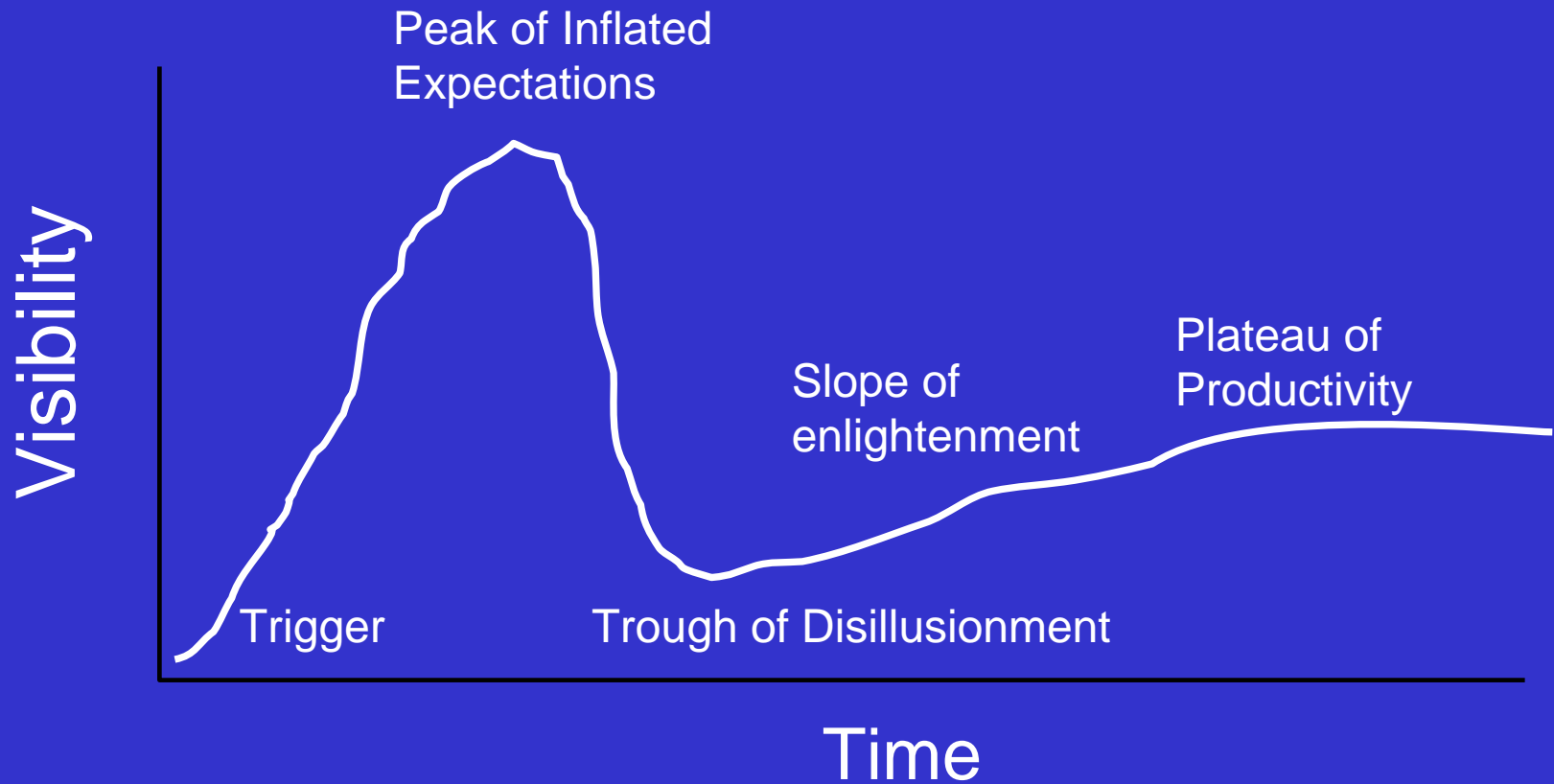
All McIDAS Functionality

The screenshot displays the McIDAS software interface within a Mozilla Firefox browser window. The main window, titled 'McIDAS-V', features a menu bar (File, Edit, Displays, Data, Tools, Window, Help) and a toolbar. The central display area shows a satellite image of a cloud system with green contour lines overlaid. A 'Legend' panel on the right lists 'Maps' (Default Background Maps, World Coastlines) and 'Imagery' (McIDAS-X - Frame). Below the main display, a status bar shows 'Memory: 94/106/266 MB' and coordinates: 'Latitude: 46.7 Longitude: -77.3 Altitude: -3780.7 m'. A control panel at the bottom includes sliders for 'Vertical Position' (Bottom, Middle, Top) and 'Pixel Sampling' (0, 5, 10), along with checkboxes for 'Image' and 'Graphics', a 'Command Line' field, and an 'Apply' button. A terminal window in the bottom right corner shows the following output:

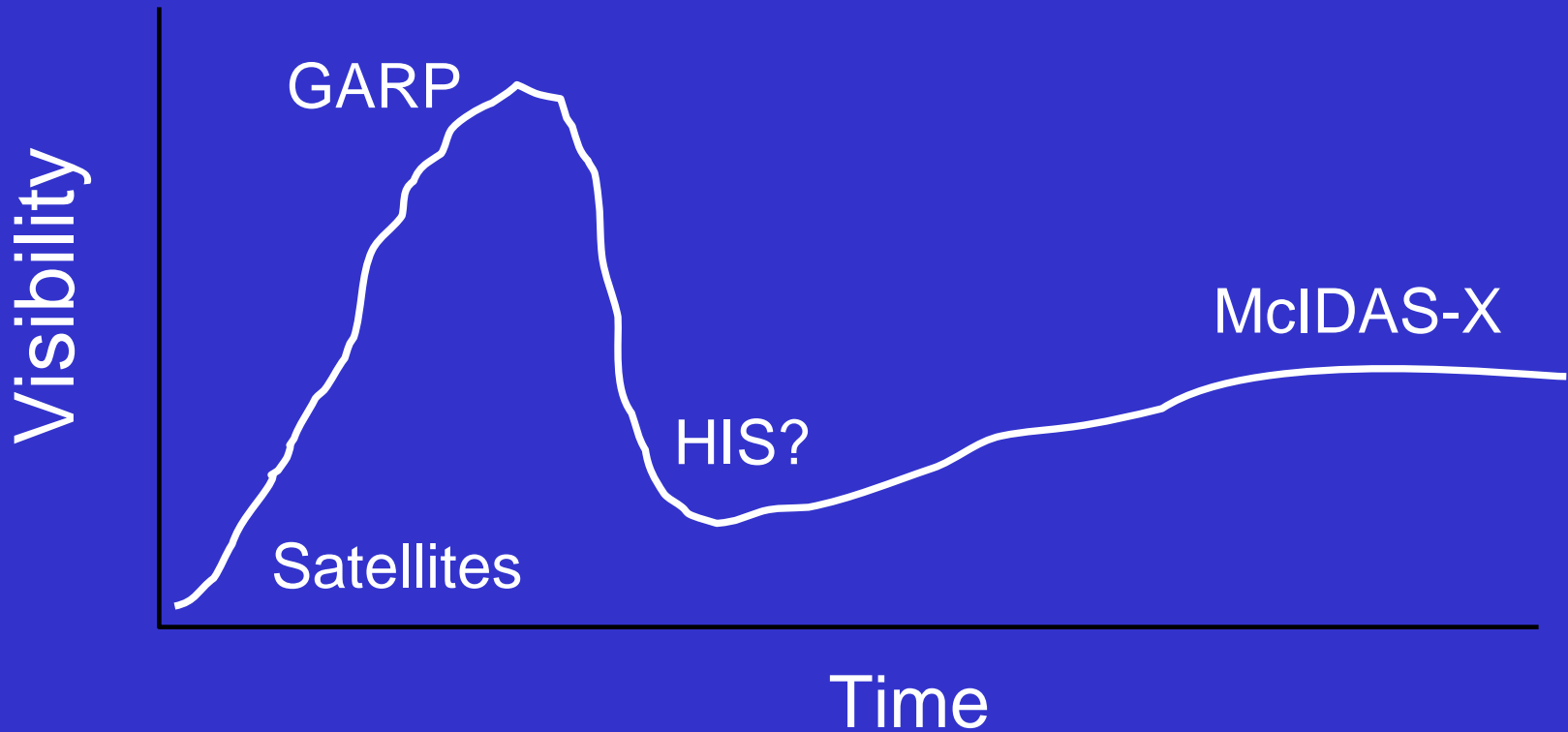
```
McIDAS-X 2007: davep@occam
Accessing Dataset Name = RTP1SRC/SFC HOURLY,ALL
Latitude increment is 0.5000 Longitude increment is 0.5000
Number of data points input to objective analysis: 635
PTCON: Done
SFCCON = Done
Number of stations plotted: 1
SYNPLOT: Done
SF 1
ERASE
Erased image frame(s) 1-1
Erased graphic frame(s) 1-1
ERASE: Done
IMGDISP EASTS/CONUS,-1 BAND=4 STA=KMSN
Beginning Image Data transfer, bytes= 402816
IMGDISP: loaded frame 1
IMGDISP: done
EU REST IMAGE
EU: Restoring IMAGE.ET to Frame(s)= 1
EU: Done
MCLISTEN
Not listening
MCLISTEN START
Started listening on port 8080
IPV 0000 0000 0000 0000
Date Time 1
1 1 random 27 Aug 2007 230 14:21:06 0
```

The system tray at the bottom indicates the date and time as 'Mon Aug 27, 9:21 AM' and shows the 'Local' and 'Datacenter' status.

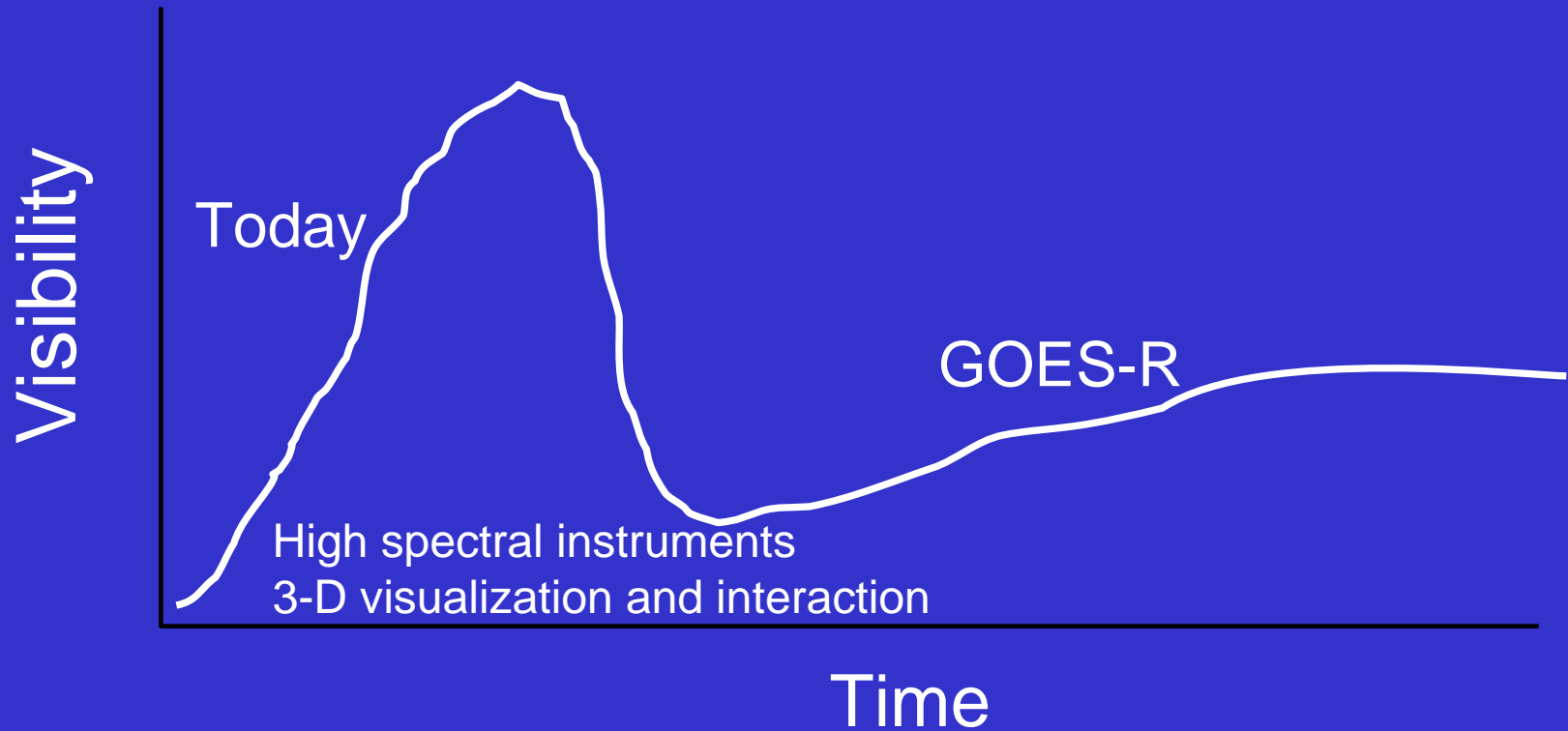
Gartner's Hype Cycle



Gartner's Hype Cycle for McIDAS...



Gartner's Hype Cycle McIDAS-V...



Project Requirements

- Create a powerful and versatile software system for environmental data processing, analysis and visualization
- Support existing and evolving needs of scientific research and algorithm/applications development for new programs
- Support data fusion and algorithm interoperability from existing and future sources
- Continue to fully support McIDAS Users' Group (MUG) and McIDAS-X functionality as users transition to McIDAS-V
- Support operational users by providing frameworks in McIDAS-V, enabling a natural transition path for research results into operations
- Use system to educate students in remote sensing and physical sciences; involve students in its development, evolution and use

SUMMARY

- I'll want it....
- You'll want it...
- Take the workshop on McIDAS-V
 - First hand experience
 - Provide feedback