

**Where to click to get data from
all the instruments discuss(ed)
during the workshop**

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How is the Sun doing?

All real time information about the Sun, such as sunspots, CME (whether it is coming to us or not and the time it takes to reach us, Co-rotating corona holes, some impacts that we observe on the ground because of the Sun misbehavior.

In general, all space weather related phenomenon is featured here on the real time base.

<http://www.spaceweather.com/>

Where can we get more picture of the Sun?

The CME and CIR structures of Sun is continuously monitored by the sophisticated camera deployed onboard SOHO, STEREO A & B, and SDO space crafts and more pictures and movies can be found from

[SOHO Data-Base](#)

<http://sohowww.nascom.nasa.gov/data/>

[STEREO Data-Base](#)

http://www.nasa.gov/mission_pages/stereo/main/

[Solar Dynamics Observatory \(SDO\)](#)

<http://sdo.gsfc.nasa.gov/>

Where can we get about solar wind data?

2000/09/12 11:54

Solar wind speed, density, temperature, magnetic field (IMF), ram and dynamic pressure, and more

ACE space craft (Real time ACE data)

<http://www.srl.caltech.edu/ACE/ASC/level2/>

<http://www.swpc.noaa.gov/ace/> (Real time)

WIND space crafts

<http://wind.nasa.gov/data.php>

Where can we get Geomagnetic indices

Dst, KP, AE, AL, and AU indices!

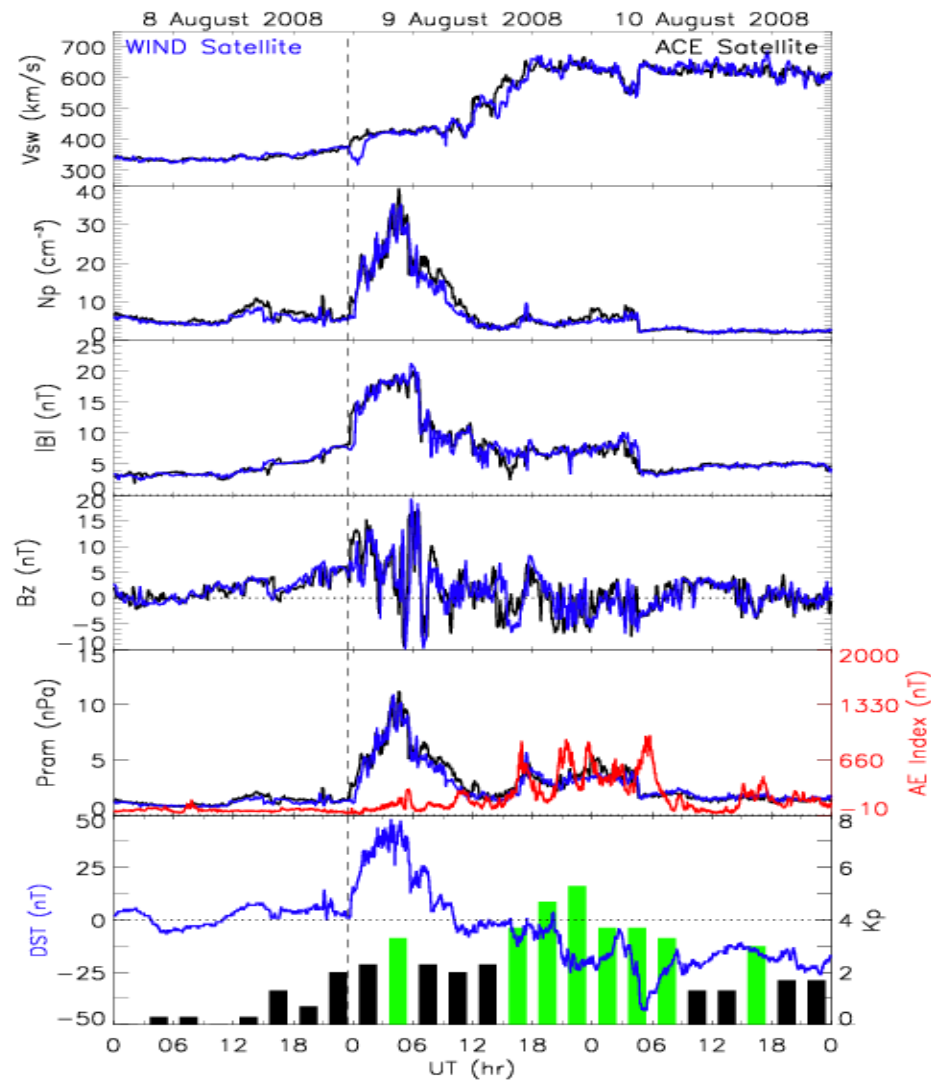
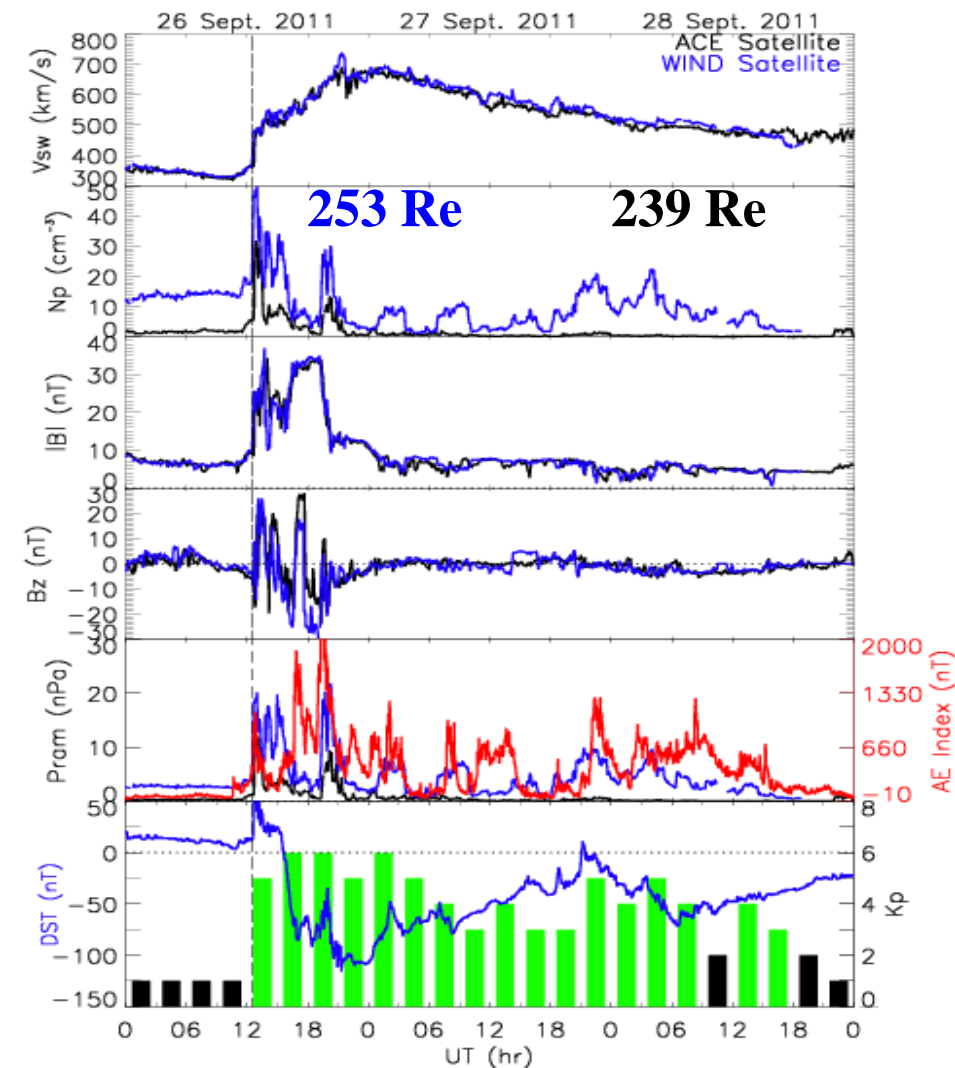
- Kyoto University

<http://wdc.kugi.kyoto-u.ac.jp/wdc/Sec3.html>

- World data center (Russia)

<http://www.wdcb.ru/stp/data/geomagni.ind/>

Examples of solar wind and magnetic indices



Where to find magnetometer data?

Magnetometer Data Sets

Intermagnet magnetometer Network

http://www.intermagnet.org/Welcom_e.php

AMBER Magnetometer Data

AMBER magnetometer Network

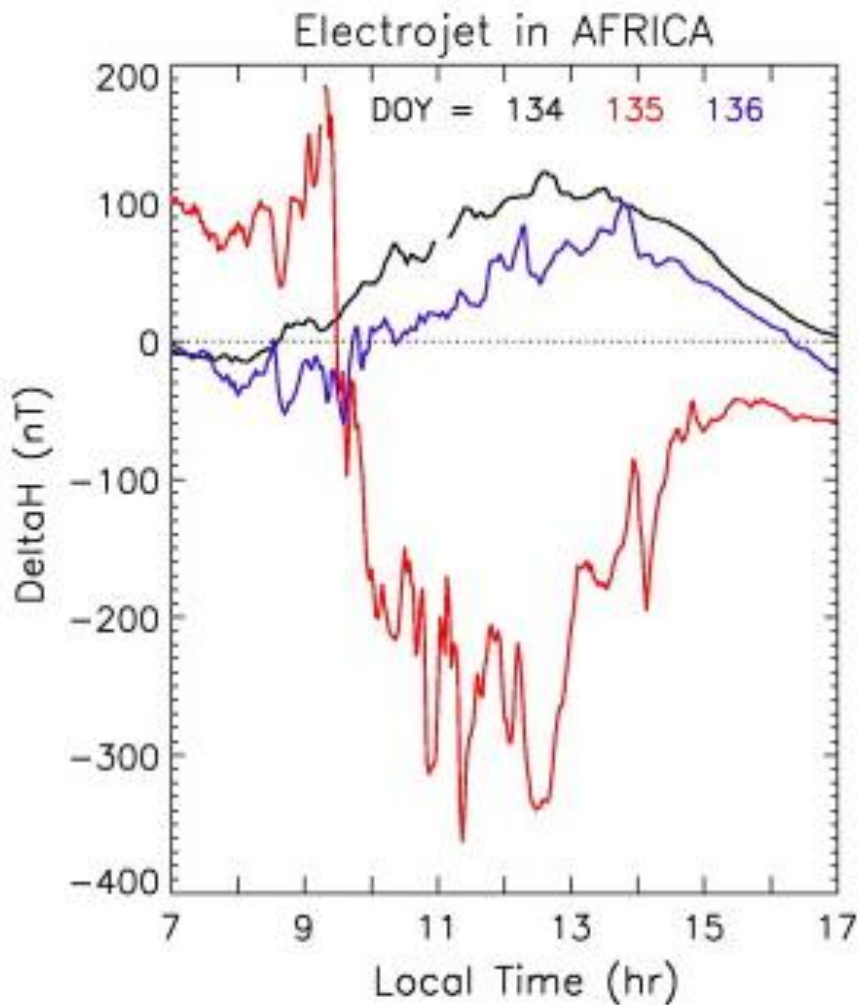
<http://magnetometers.bc.edu/index.php/amber>

SuperMag Magnetometer Data

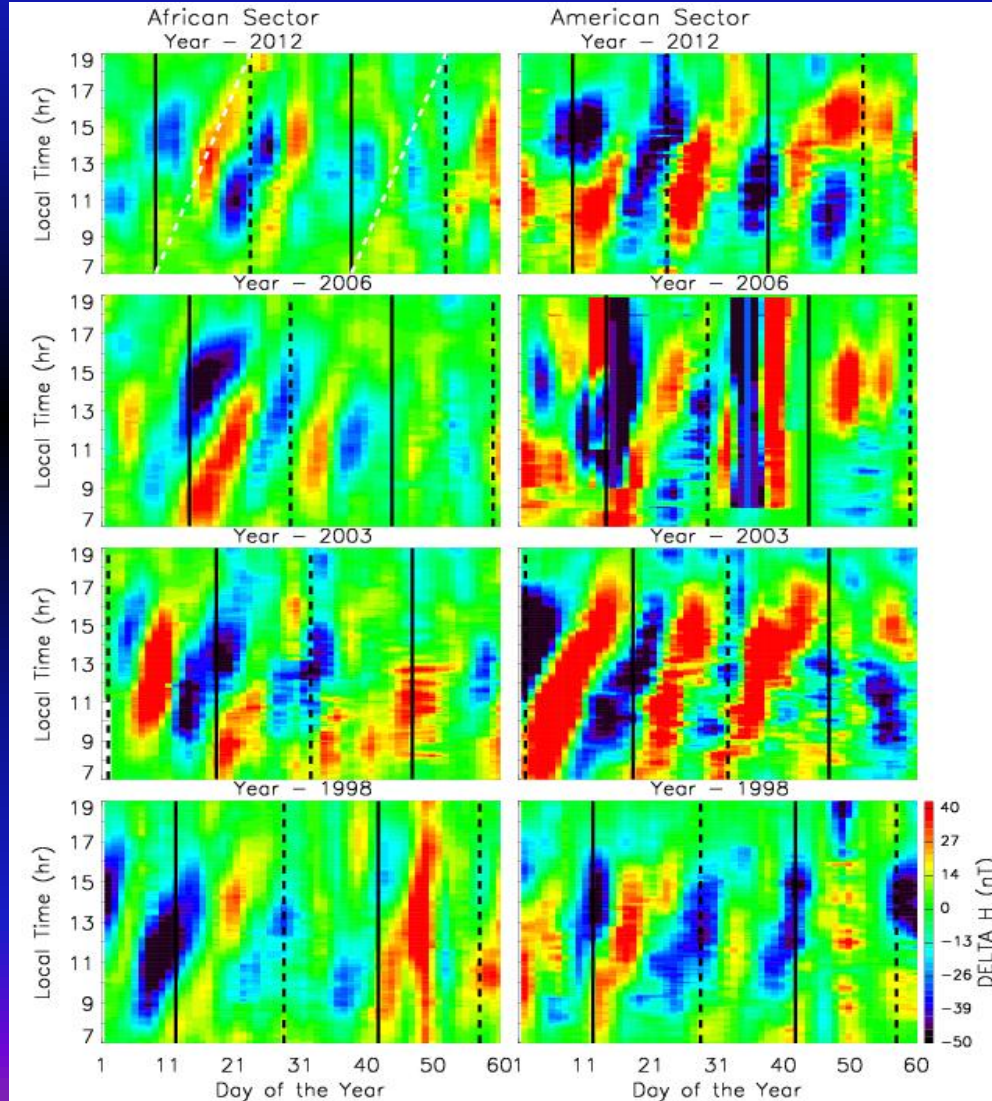
Supermag magnetometer Network

<http://supermag.jhuapl.edu/mag/>

What can you do with magnetometer data?



Ngwira et al., ASR, 2012



GPS RINEX databases

SOPAC GPS RINEX Database

<http://sopac.ucsd.edu/cgi-bin/dbDataBySite.cgi>

NASA GPS RINEX Database

<ftp://cddis.gsfc.nasa.gov/pub/>

South Africa GPS RINEX Database

<http://geodesy.hartrao.ac.za/site/en/data-and-products.html>

UNAVCO GPS RINEX Database

http://facility.unavco.org/data/gnss/perm_sta.php

Position of GPS satellites in X,Y,Z Cord.

http://igs.cb.jpl.nasa.gov/components/prods_cb.html

NASA's GNSS satellite biases

<ftp://cddis.gsfc.nasa.gov/pub/gps/products/ionex/>

**TOPEX and JASON altimeter
TEC can be used to augment GPS
TEC that you have been
discussing so far?**

2000/09/12 11:54

TOPEX and JASON provide altimeter TEC (i.e, vertical TEC below 1360 km altitude) over the ocean.

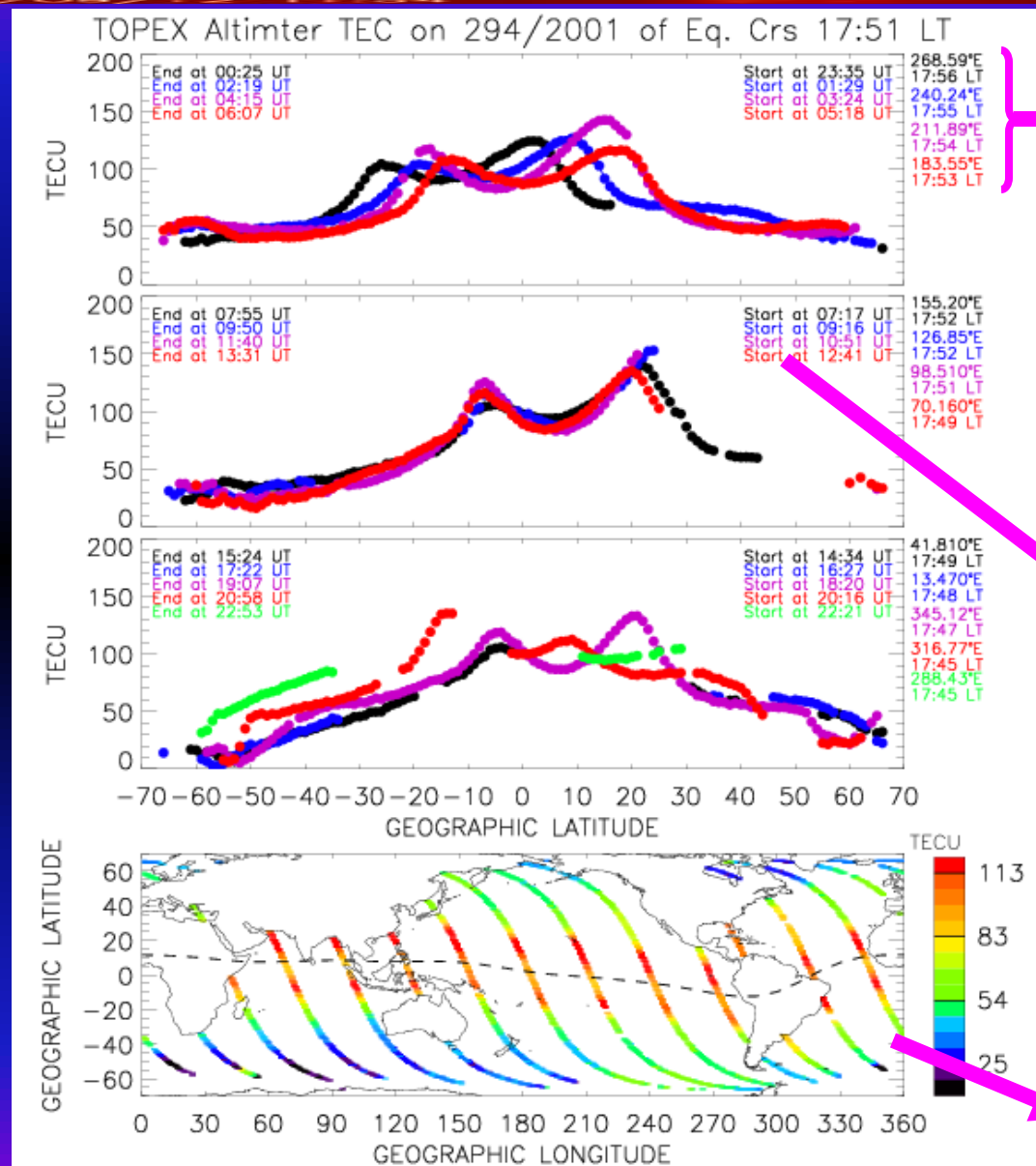
TOPEX Altimeter TEC

ftp://podaac.jpl.nasa.gov/SeaSurfaceTopography/topex/L2/tp_ssha/

JASON Altimeter TEC

ftp://podaac.jpl.nasa.gov/SeaSurfaceTopography/jason1/L2/j1_ssha/

TOPEX altimeter TEC plot

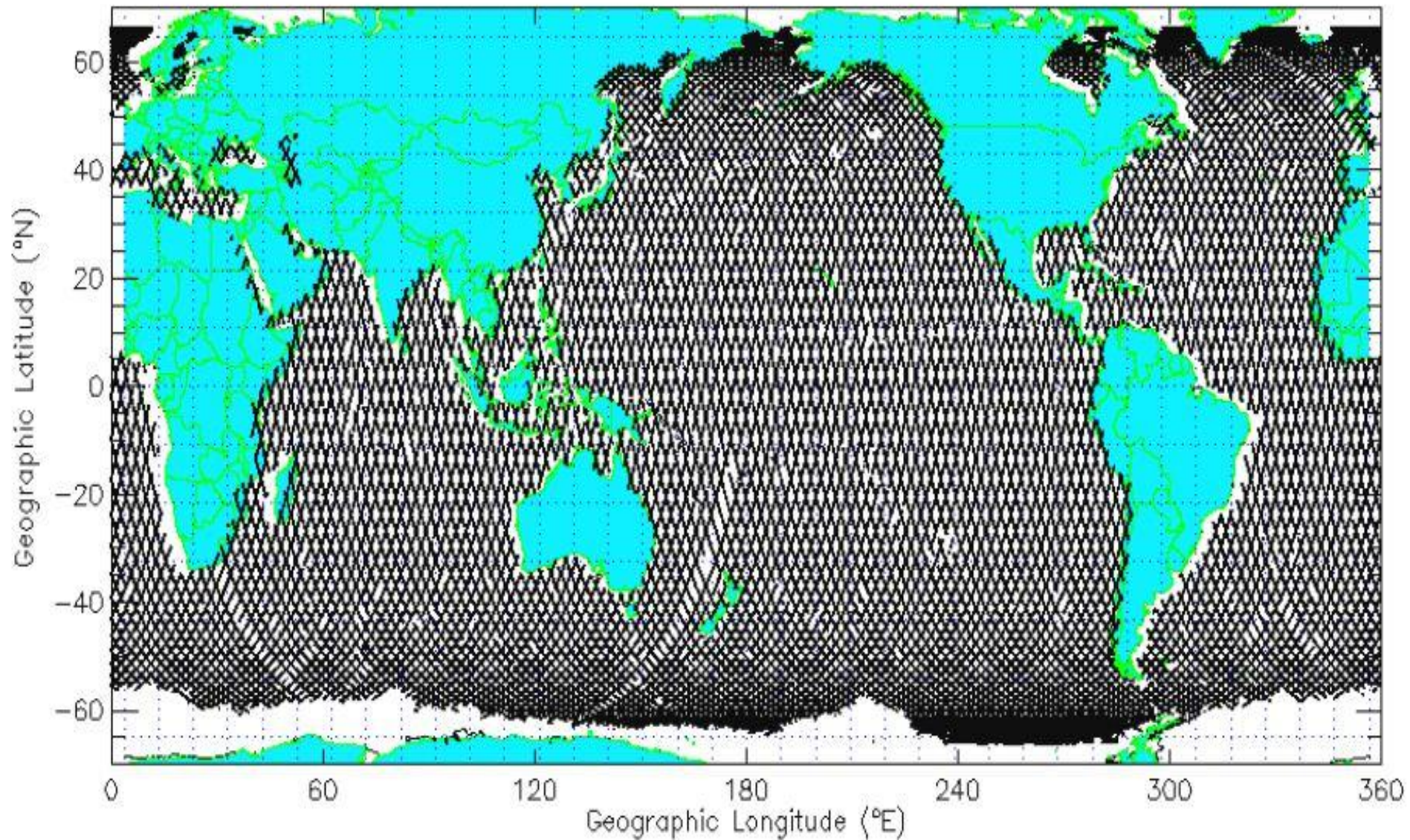


Equatorial crossing longitudes

Topex passes start and end times

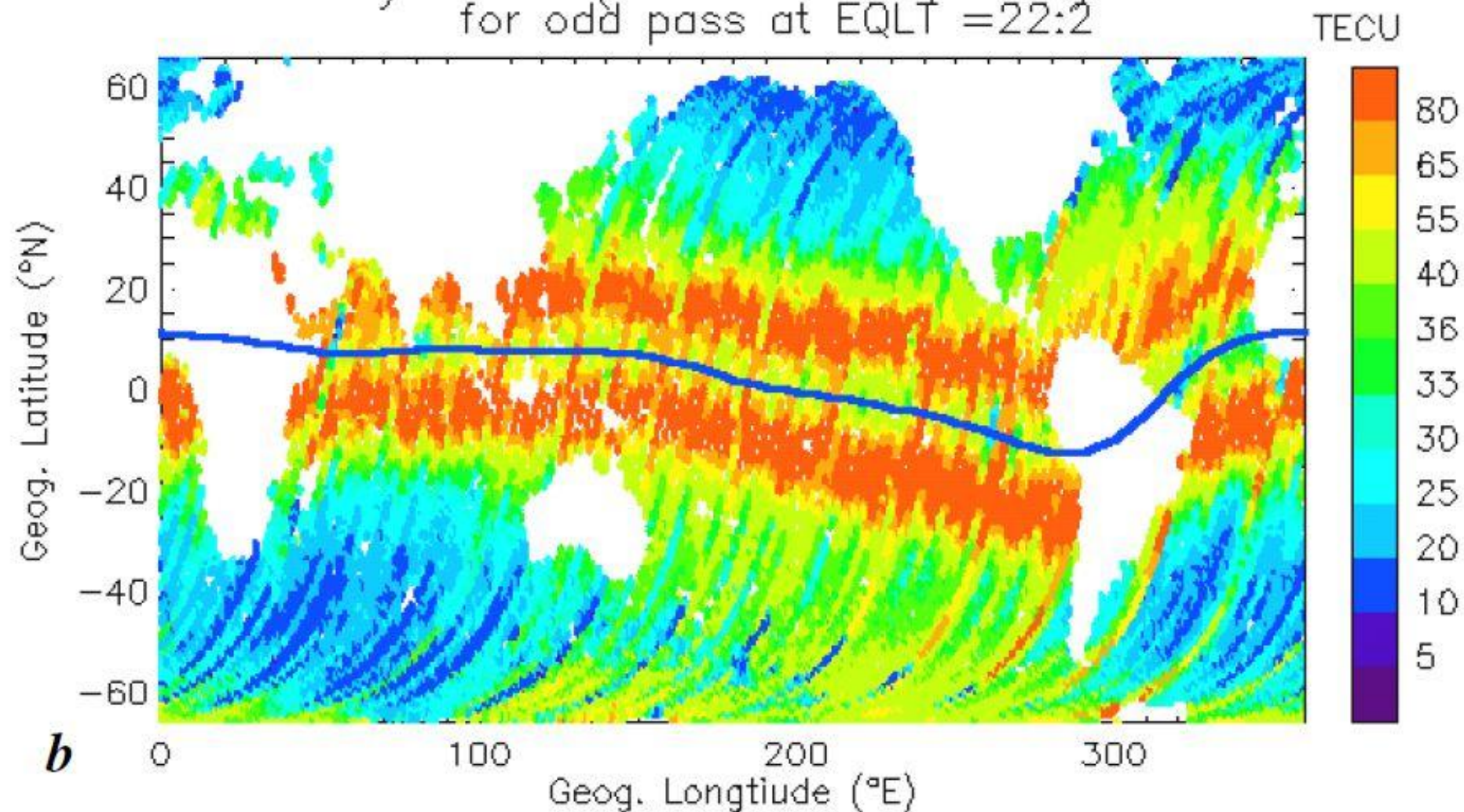
Topex TEC contour plots along its ground tracks

One cycle TOPEX Passes (10 days)



One cycle TOPEX TEC (10 days)

Cycle 315 (DOY 092–102, 2001)
for odd pass at EQLT = 22:2



Where can we get calculated GPS TEC?

2000/09/12 11:54

Madrigal data base (developed by MIT group) provide global calculated GPS TEC, interpolated 2 x 2 degree latitude and longitude. The calculated TEC is averaged every 5 minutes.

Madrigal calculated TEC data base

<http://madrigal.haystack.mit.edu/cgi-bin/madrigal/madInvent.cgi>

How about data from other LEO satellites?

2000/09/12 11:54

The COSMIC (six LEO satellites) and other LEO satellites provide two sets of very important data. (1) topside ionospheric and plasmaspheric GPS TEC (2) Occultation ionospheric density profiles (from about 70 km upto the altitude of the spacecraft).

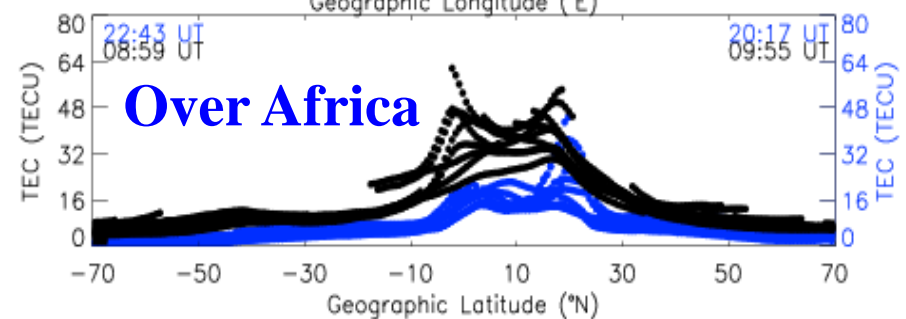
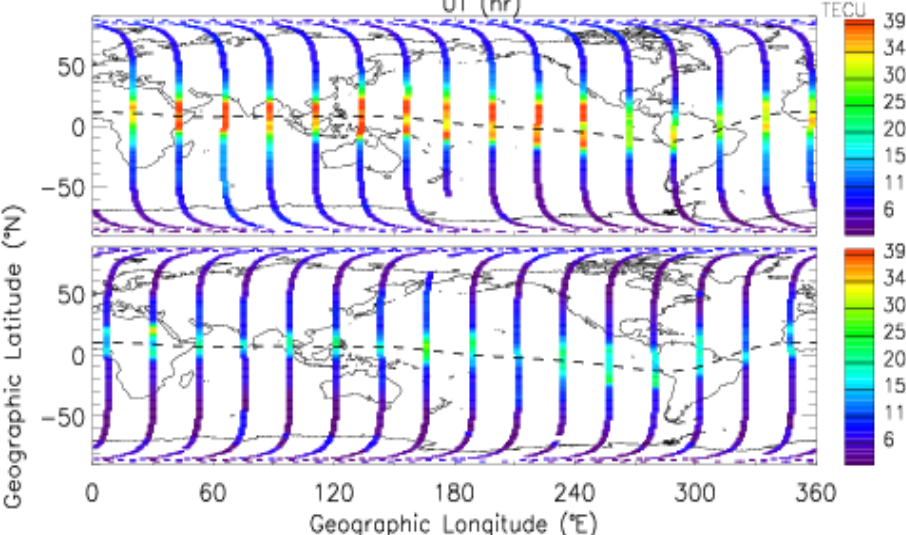
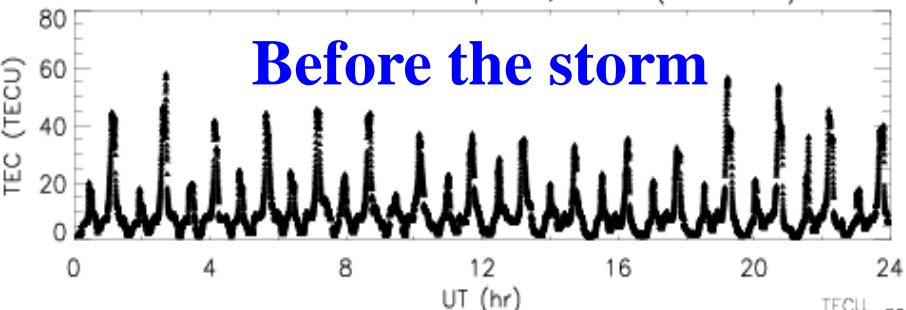
LEO satellites' data base

<http://cosmic-io.cosmic.ucar.edu/cdaac/>

Examples of LEO TEC data

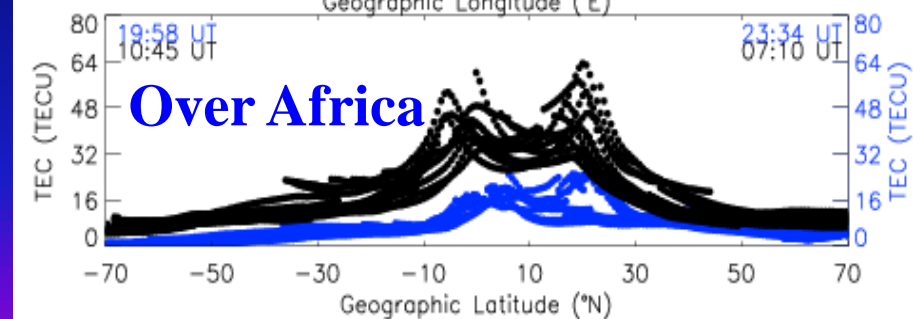
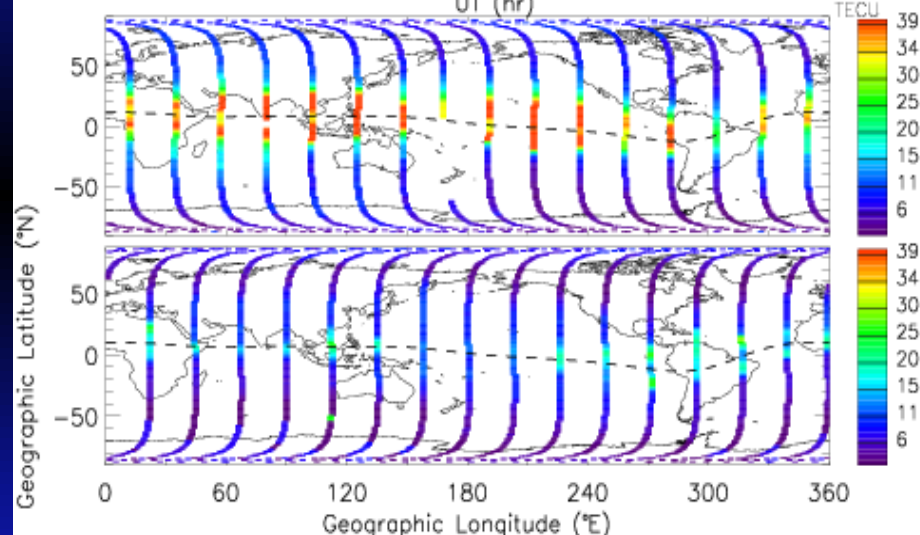
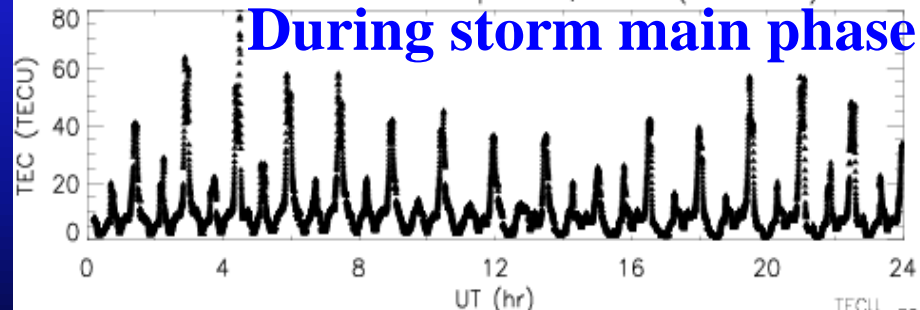
CHAMP TEC data on April 9, 2010 (DOY 100)

Before the storm

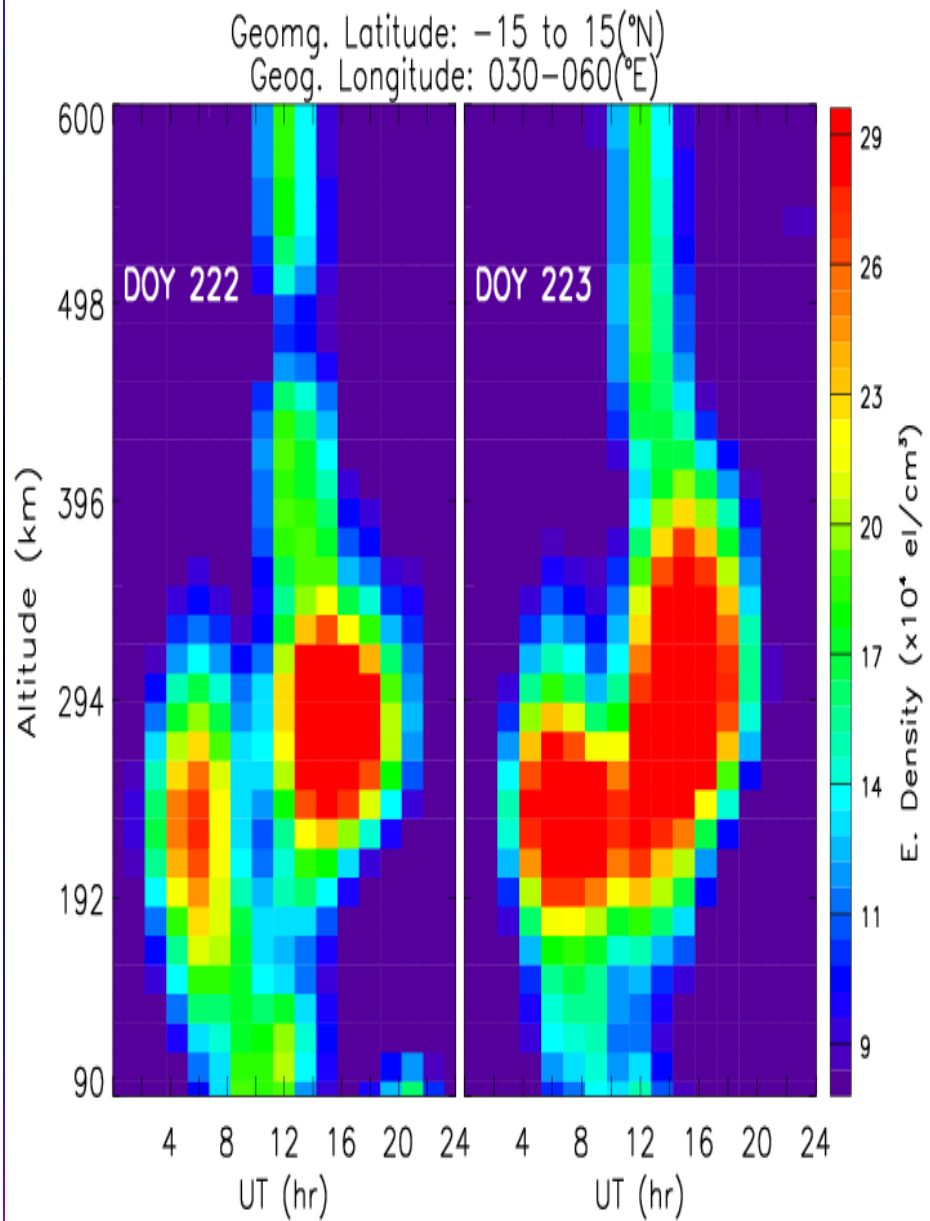
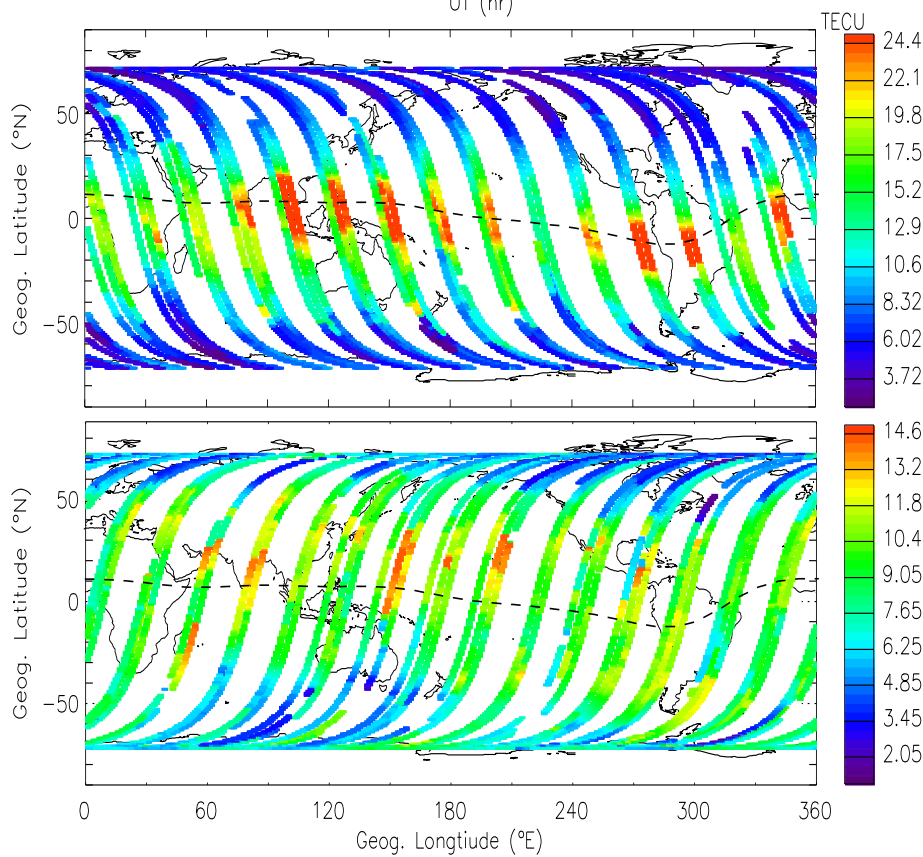
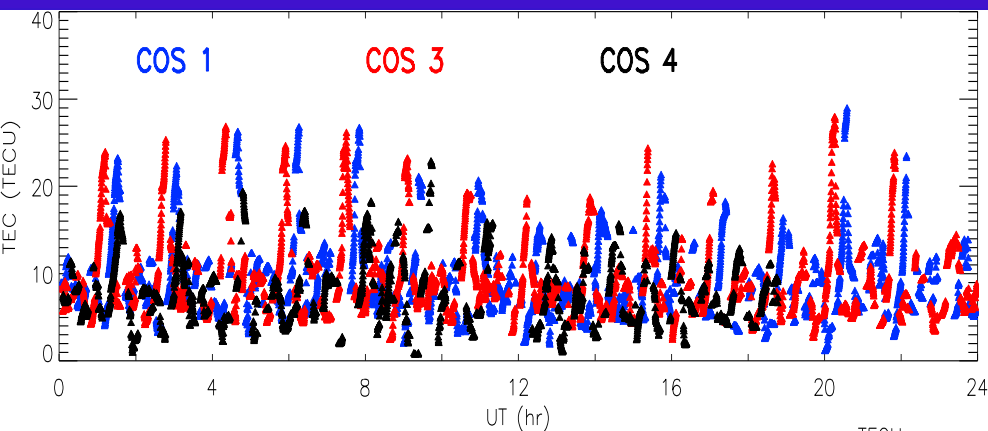


CHAMP TEC data on April 12, 2010 (DOY 103)

During storm main phase



Examples of LEO TEC density profile data



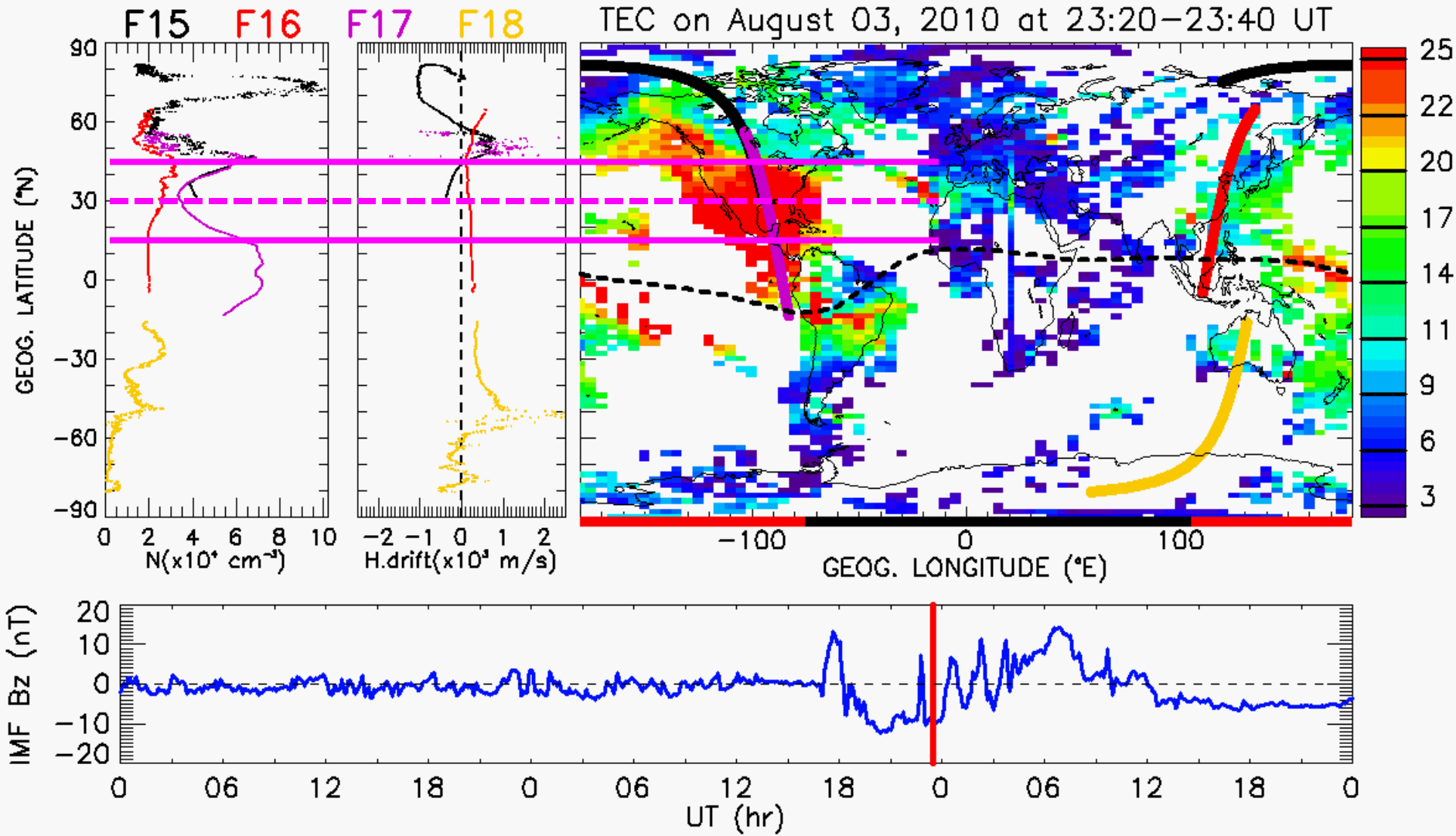
**More In situ density and
drift observation also
available from various
space crafts, such as DMSP
and C/NOFS**

2000/09/12 11:54

NASA's all public Satellite database

http://cdaweb.gsfc.nasa.gov/cdaweb/istp_public/

What do we do with C/NOFS and DMSP data?



More space weather data can also be available

Here are some of the publicly available data bases.

Coordinated Data Analysis Web (CDAWeb)

http://cdaweb.gsfc.nasa.gov/cdaweb/istp_public/

OMNI data base

http://spdf.gsfc.nasa.gov/data_orbits.html

Where to find model run outputs?

Here are some of the publicly available model run data bases.

Community Coordinated Modeling Center (CCMC)

<http://ccmc.gsfc.nasa.gov/>

Thank you!

URL: <http://www2.bc.edu/~kassie>