

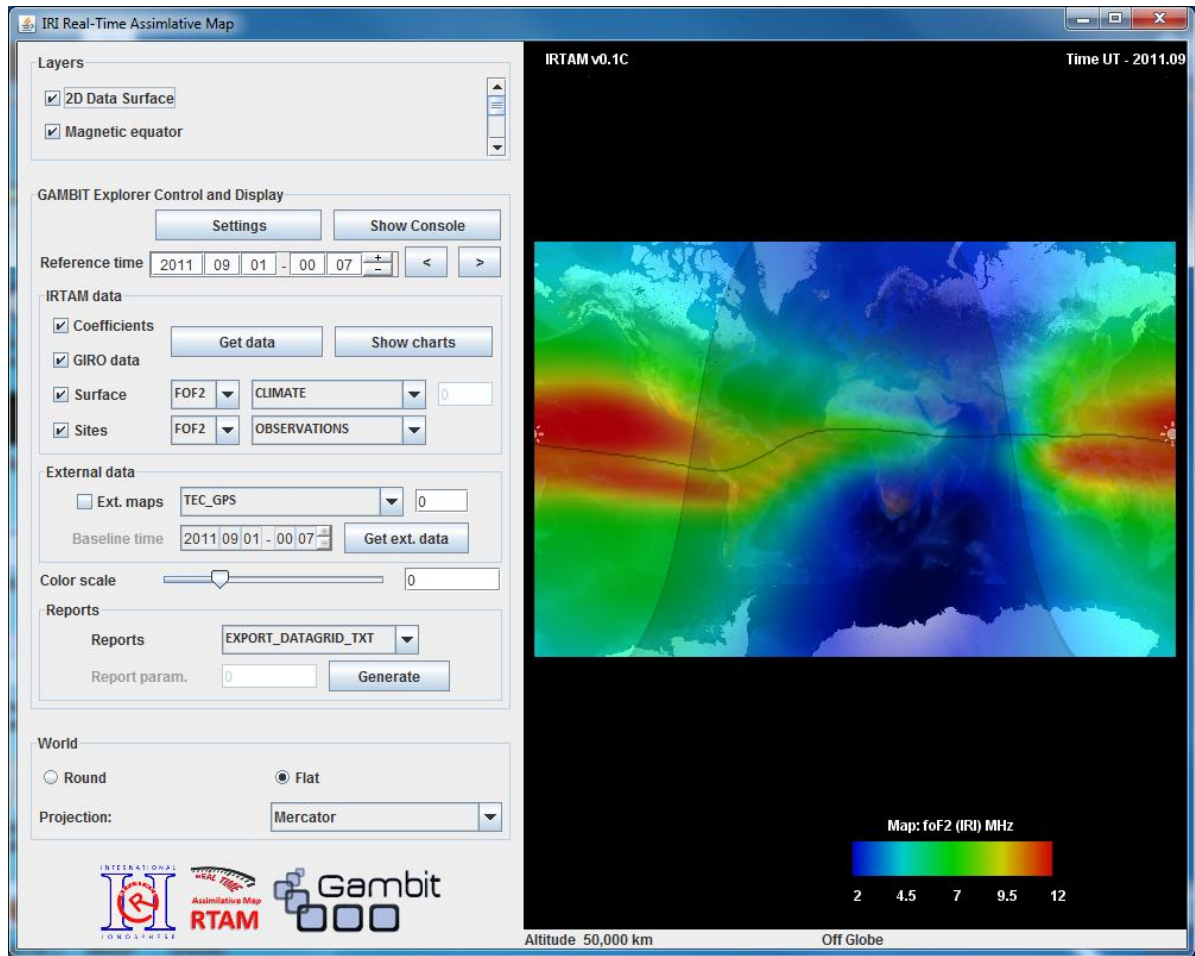
# GAMBIT Explorer User Guide

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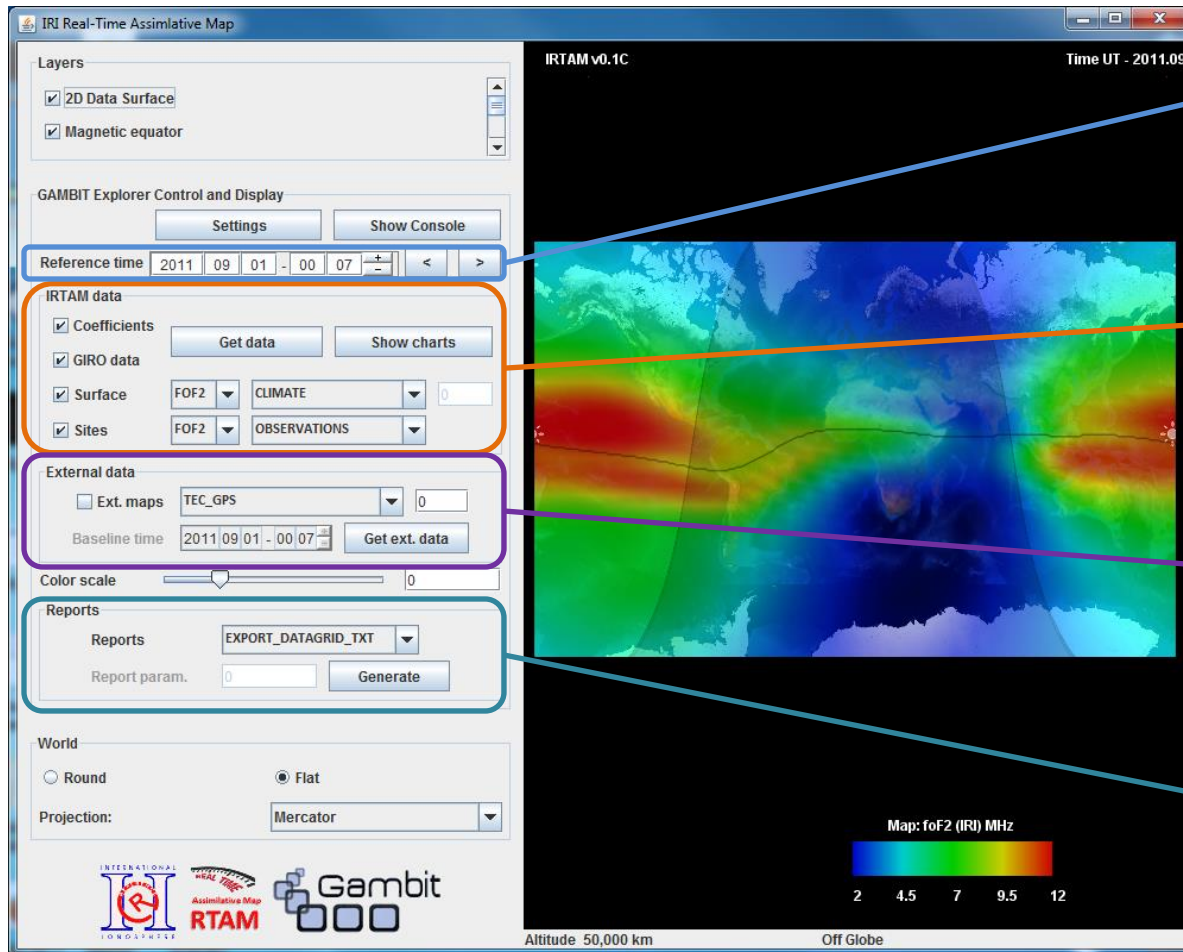
Space Science Laboratory University Massachusetts  
Lowell

# Welcome to GambitX startup interface

GAMBIT is a single frame application with all controls available on the main panel



# Requesting data for display and reports



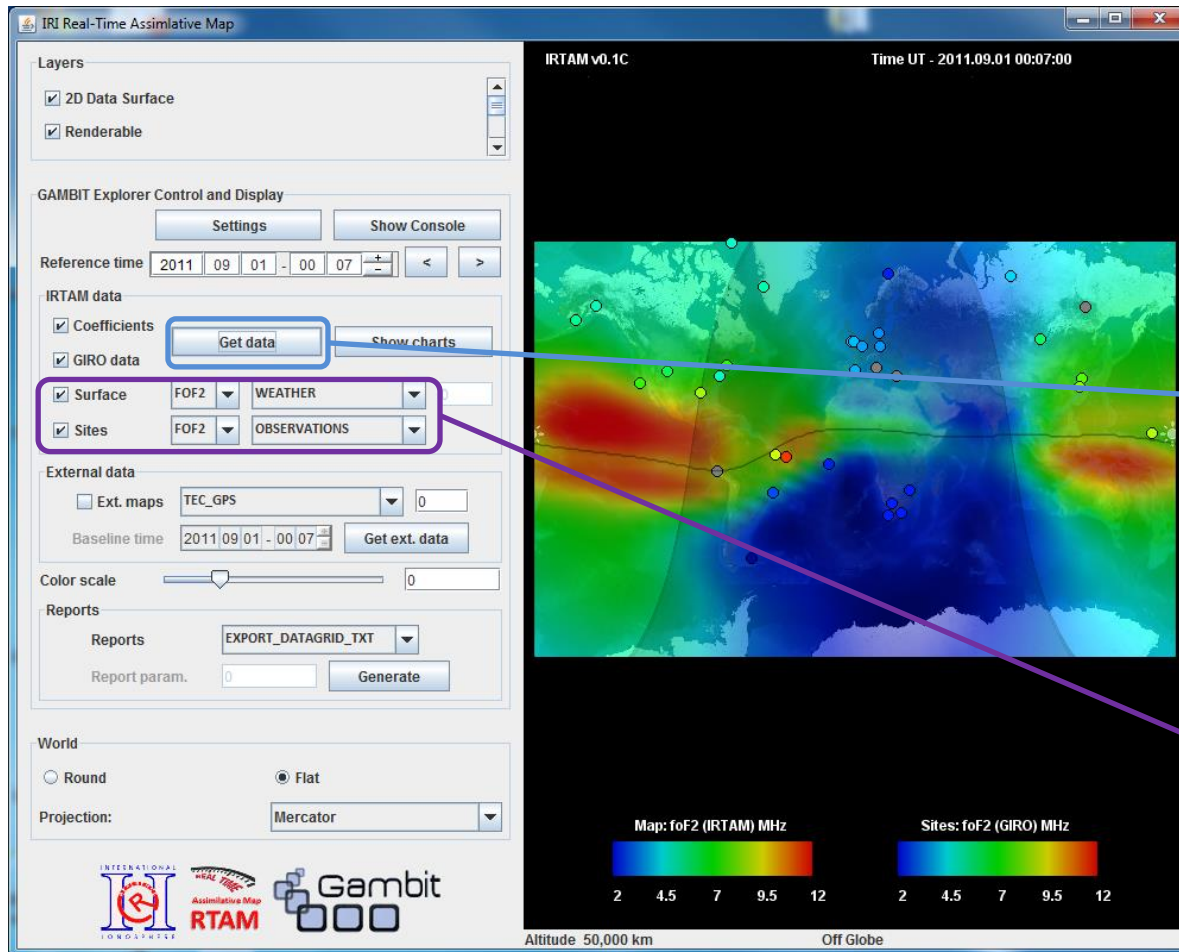
1. Select target time for which IRTAM model data will be downloaded.

2. Click on "Get Data" to initiate download. Use check boxes to control selection of data display.

3. External data are downloaded separately, but for the same reference time.

4. Several types of data reports can be generated as local files

# Data controls: Select IRTAM data for display



Layers

- 2D Data Surface
- Renderable

GAMBIT Explorer Control and Display

Settings Show Console

Reference time: 2011 09 01 - 00 07

IRTAM data

- Coefficients
- GIRO data
- Surface
- Sites

External data

Ext. maps: TEC\_GPS

Baseline time: 2011 09 01 - 00 07

Color scale: 0

Reports

Reports: EXPORT\_DATAGRID\_TXT

Report param.: 0

World

Round Flat

Projection: Mercator

Map: foF2 (IRTAM) MHz

Sites: foF2 (GIRO) MHz

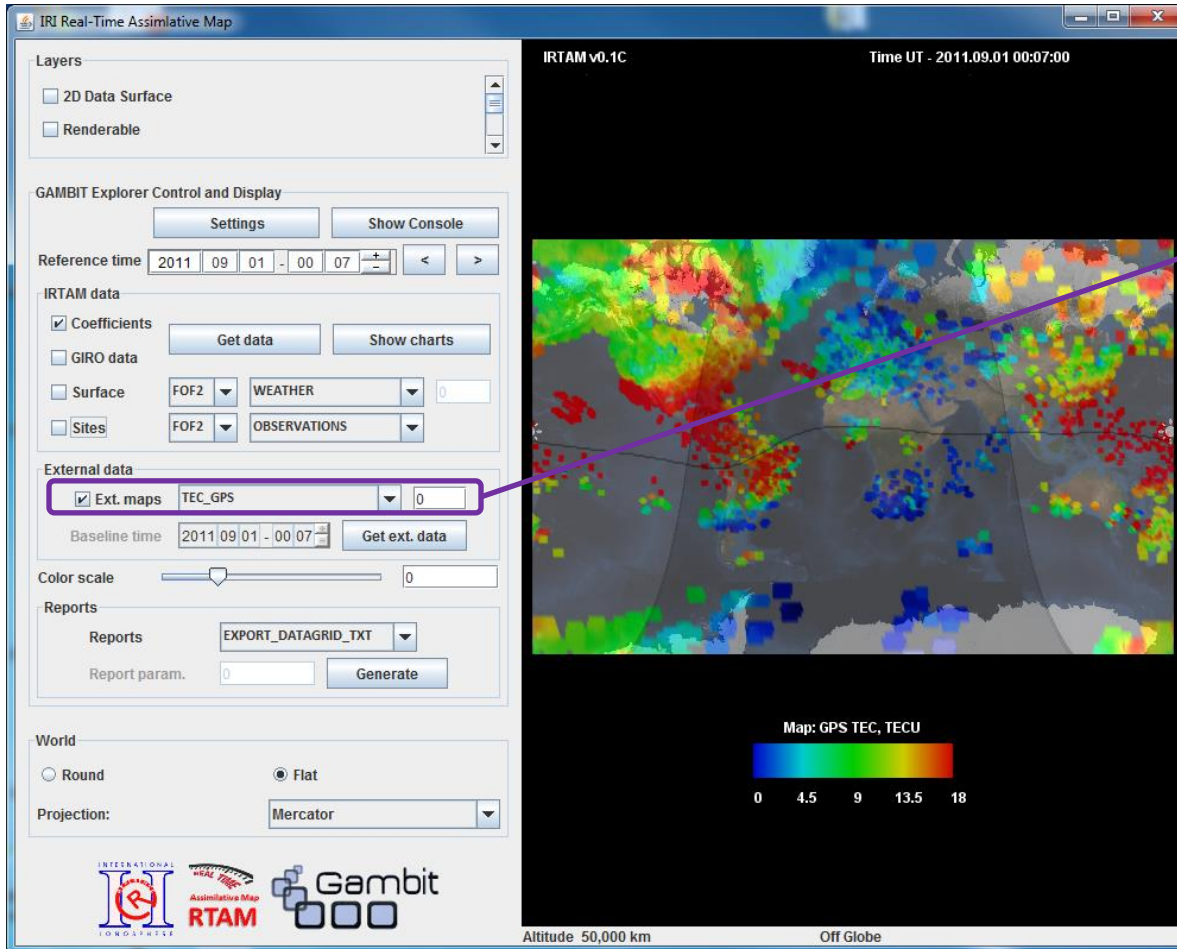
Altitude: 50,000 km

Off Globe

Make sure data are requested and downloaded.

Select an ionospheric characteristic from the list (*foF2*, *hmF2* etc) and map type (*CLIMATE* for IRI, *WEATHER* for IRTAM, *DELTA* for differential maps showing difference between IRTAM and IRI).

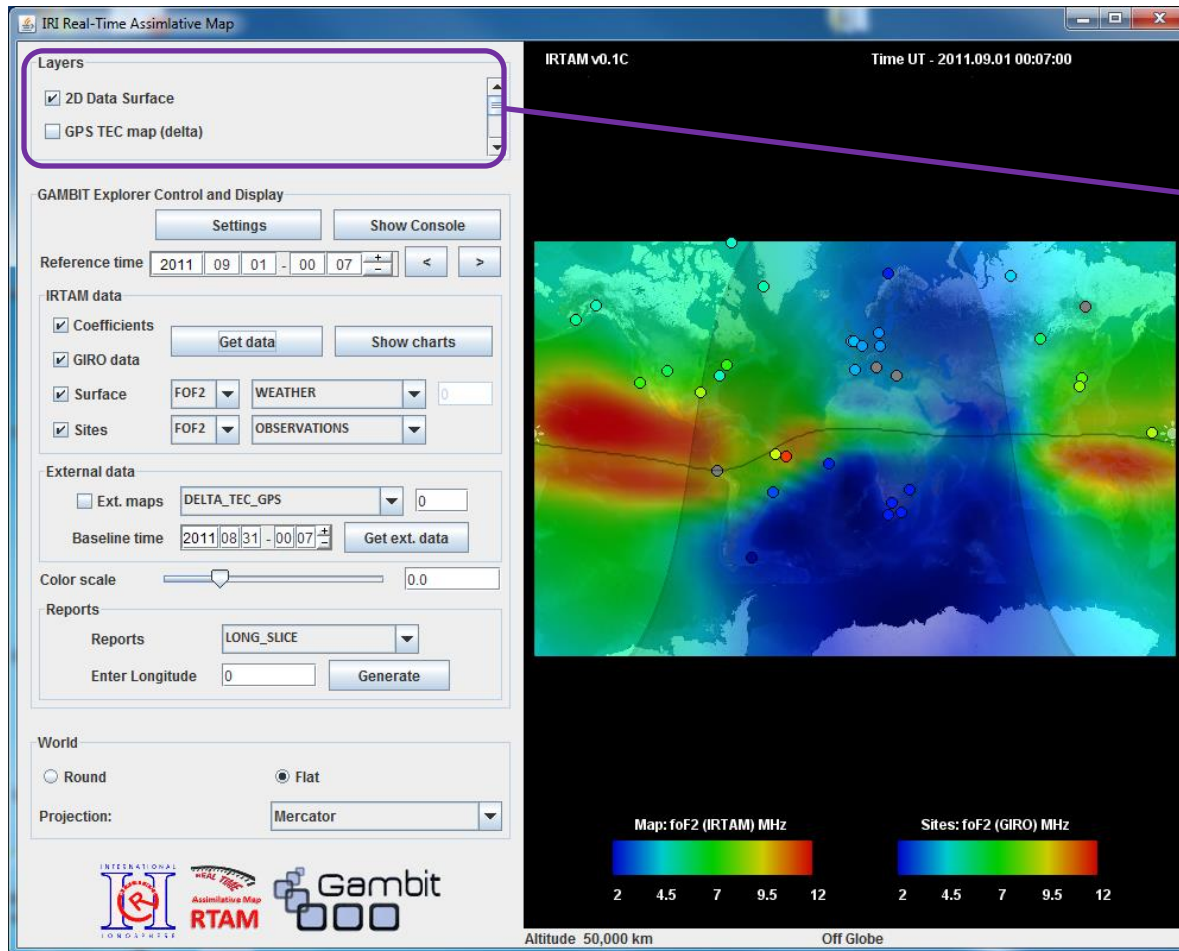
# Data controls: Select external data for display [GPS TEC of Madrigal database]



The screenshot shows the IRI Real-Time Assimilative Map (IRTAM) v0.1C interface. The 'External data' section is highlighted with a purple box, indicating that 'Ext. maps' is checked and 'TEC\_GPS' is selected. A purple arrow points from this box to a callout on the right. The main map area displays a global view of GPS TEC data with a color scale from 0 to 18 TECU. The interface includes various control panels for layers, reference time, and reports.

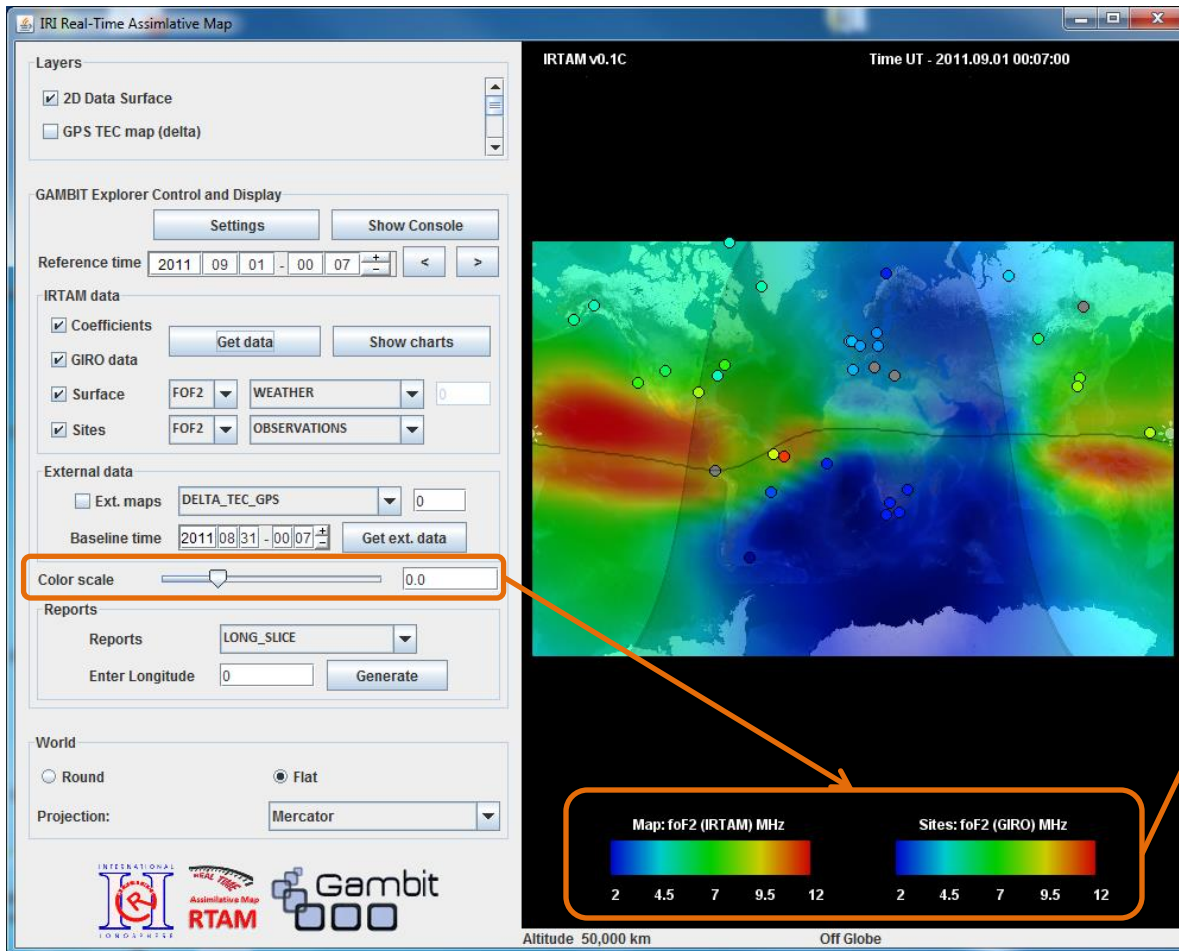
Download external data from other sources for comparison studies and validation. Note that these external data resources are not assimilated by IRTAM.

# Select background information



Specify which layers you want to be displayed to optimize visualization. The number of available layers is dynamic and different for different selection of data.

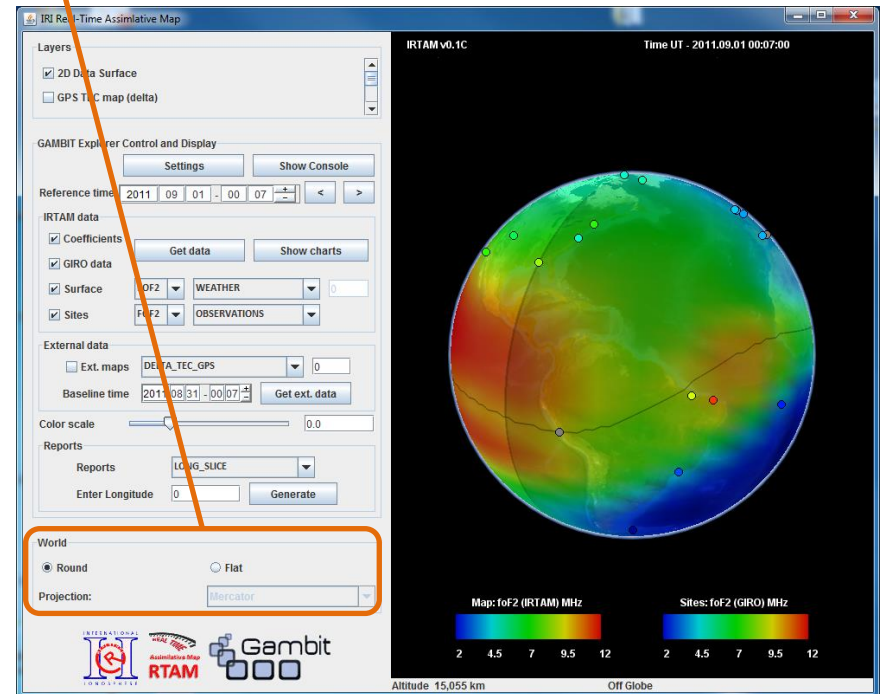
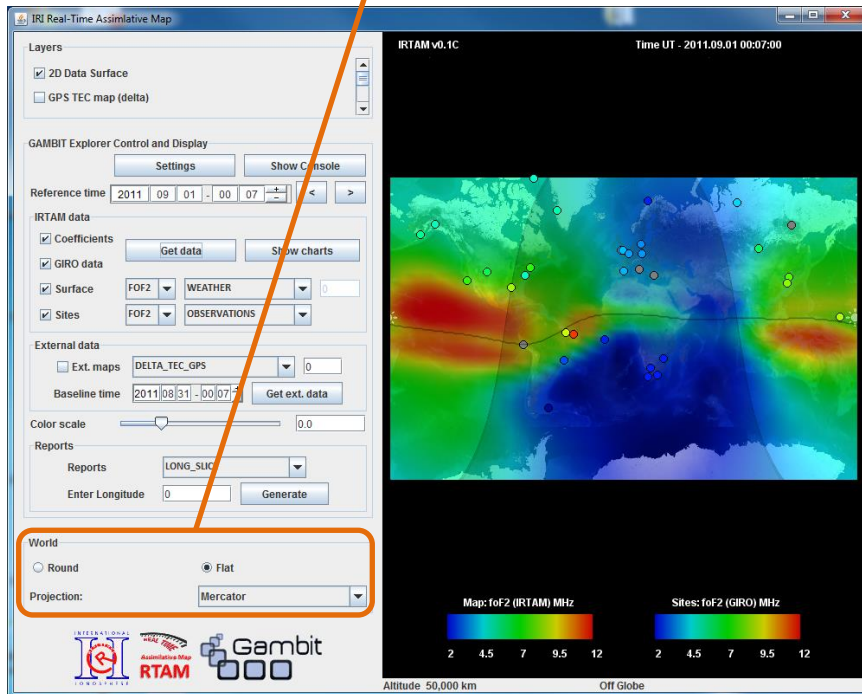
# Optimization of Color Mapping



Manually changing of color scale is useful when automatically defined color codes are saturated and do not represent some fine details.

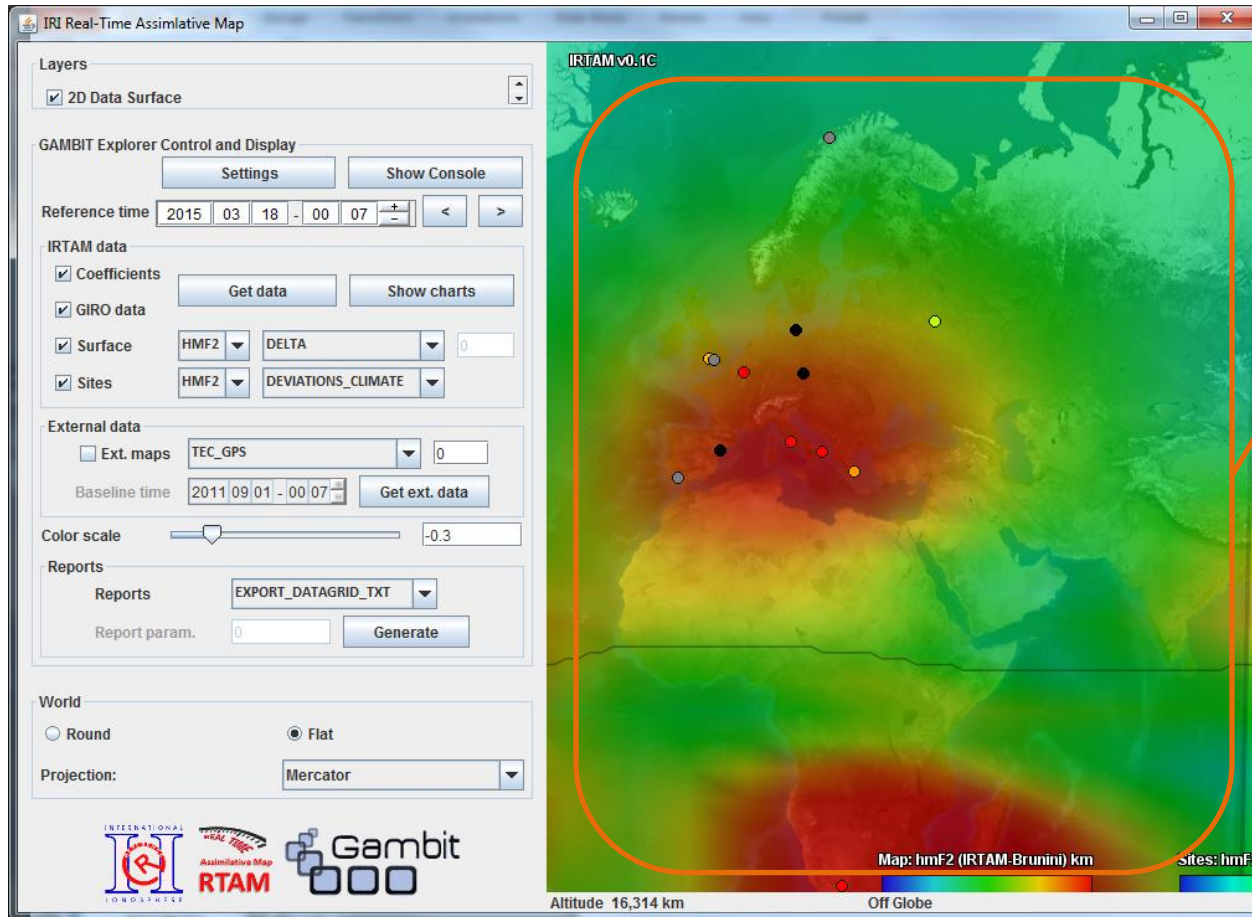
# World Display Options

Select the globe appearance (Flat and Round) and projection (Mercator, Lat-Lon and etc.).





# Zoom in for greater detail



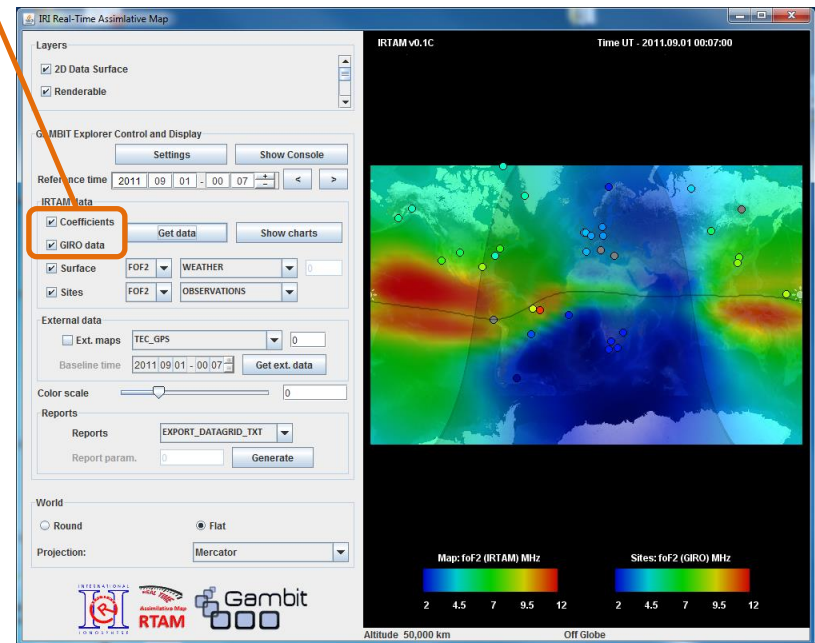
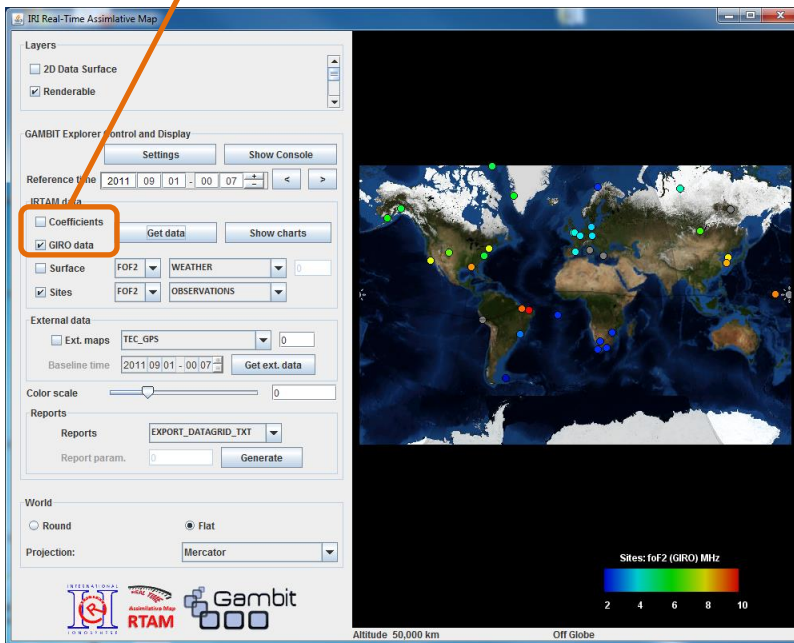
Use mouse drag and mouse wheel to navigate and zoom in the world display

Keyboard command are also available (arrows and page up and down)

# Optimize Data Access

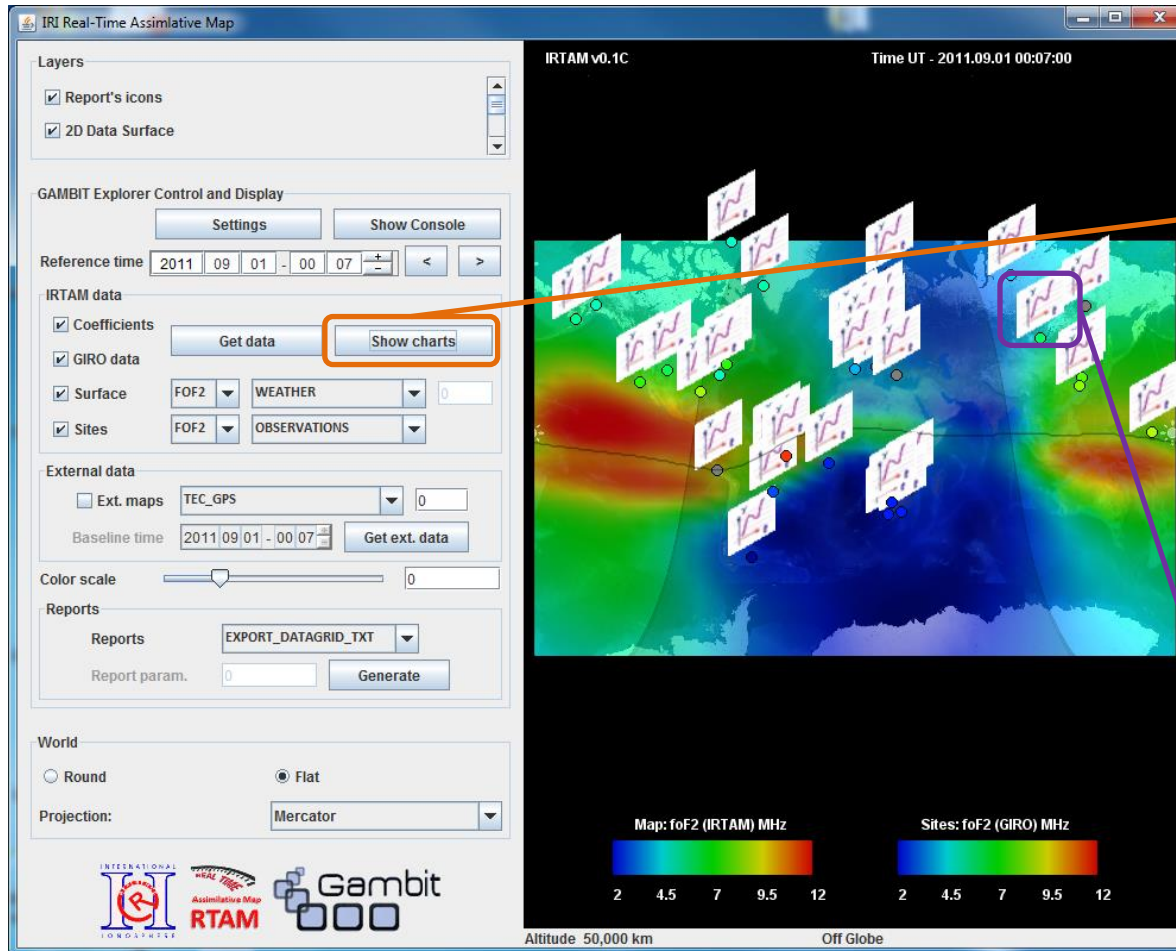
## Partial data downloads for faster access

For faster download:  
 uncheck data products  
 that you do not need for  
 analysis. Note the different  
 selection results.

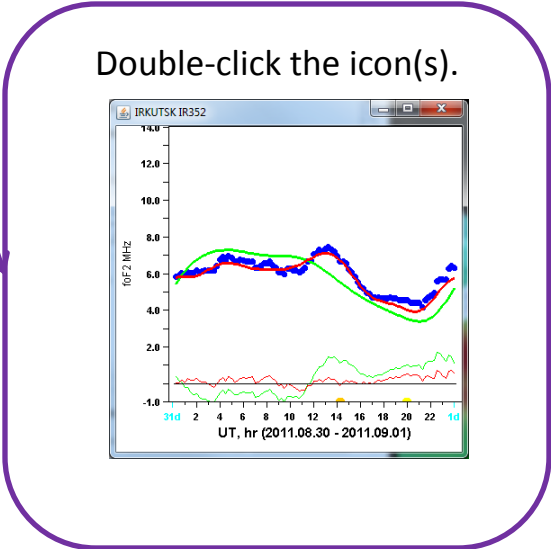


# Data controls: IRTAM data.

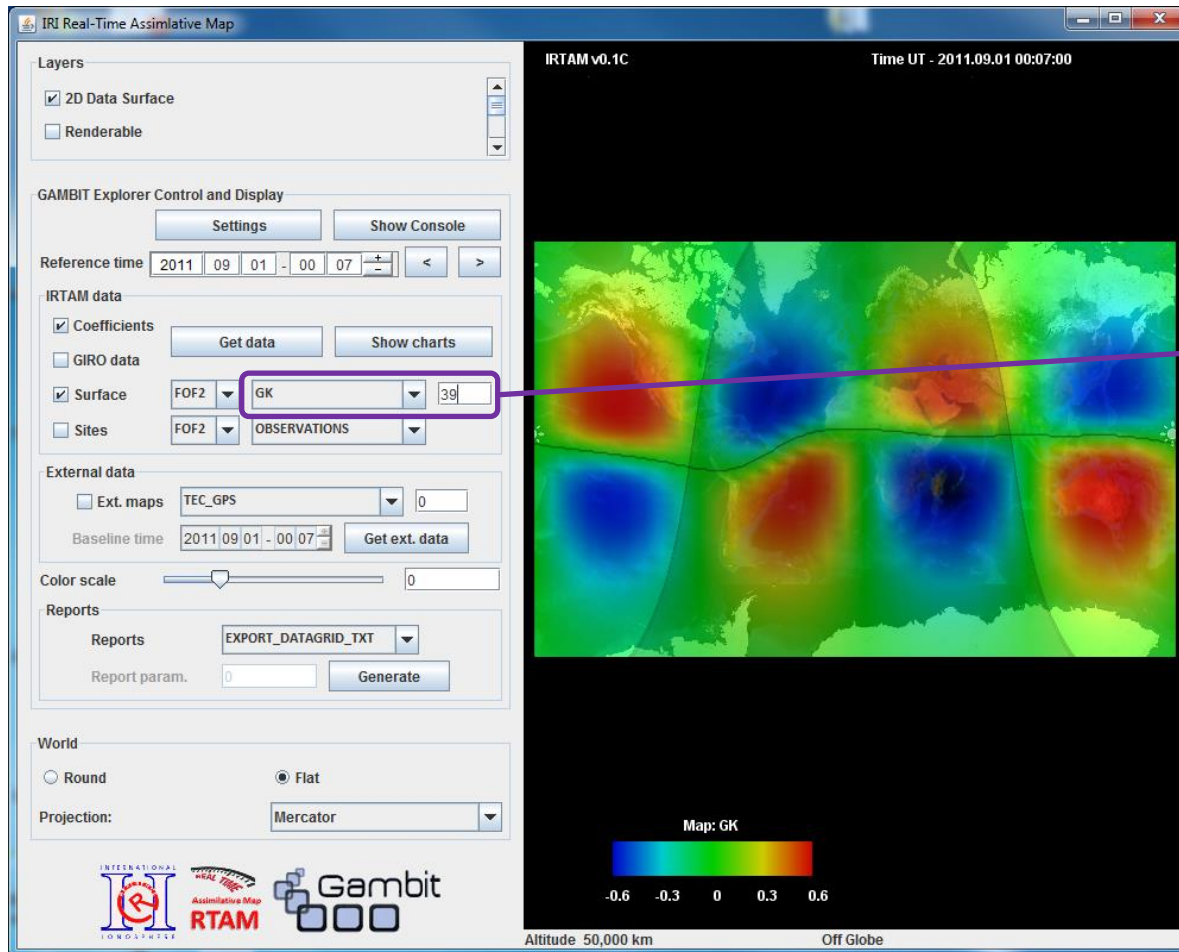
## Explore source data used for assimilative maps



Inspect differences between GIRO observations and IRI prediction at individual locations. Observe assimilation results restored from the global map at each GIRO site.



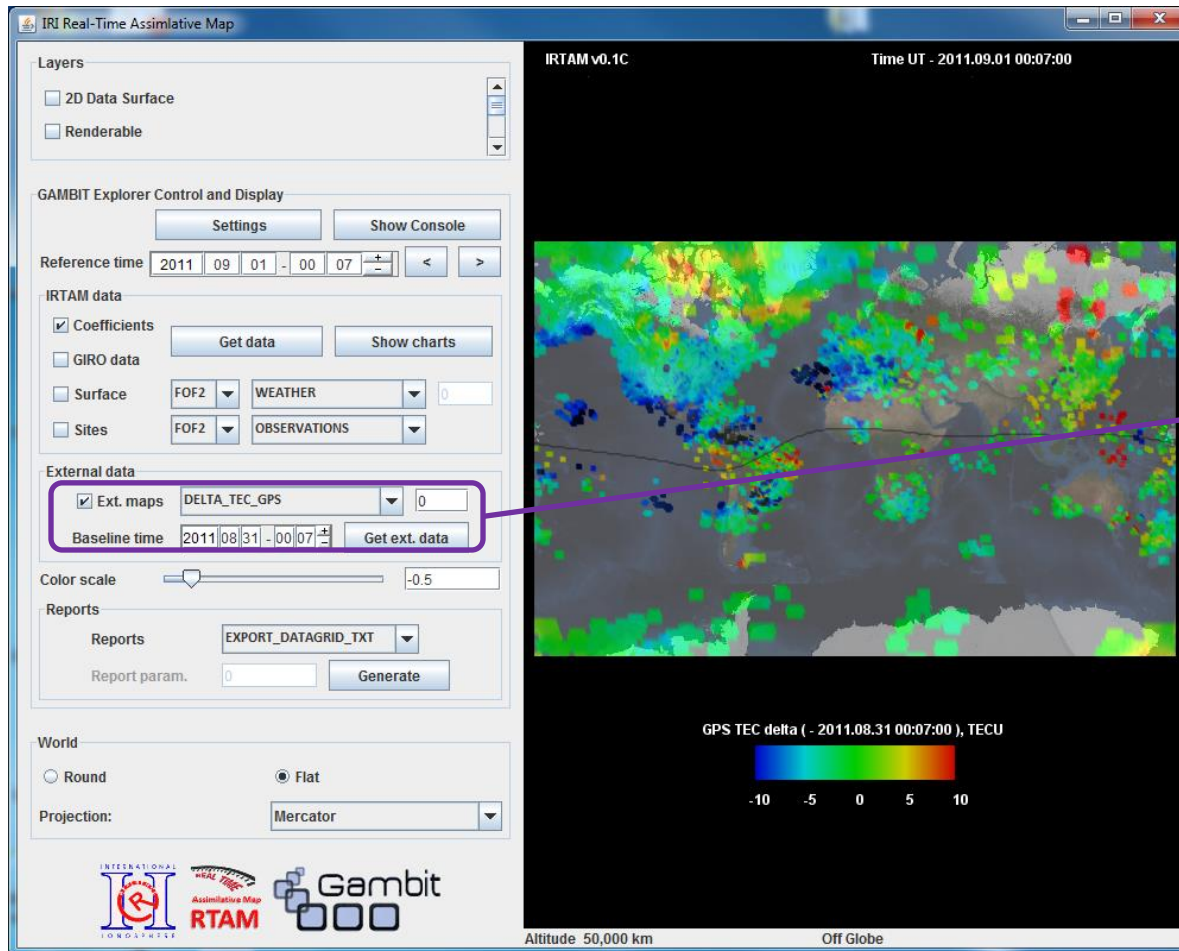
# Data controls: IRTAM data. Geographical functions



Inspect spatial expansion functions (“*geographic*” functions  $G_k$  by Jones and Gallet) that optimize representation of the ionospheric characteristics in both geographic and geomagnetic field frames. Enter the geofunction index  $k$  (from 0 to 75) in the text field to visualize  $G_k$ .

# Data controls: External data.

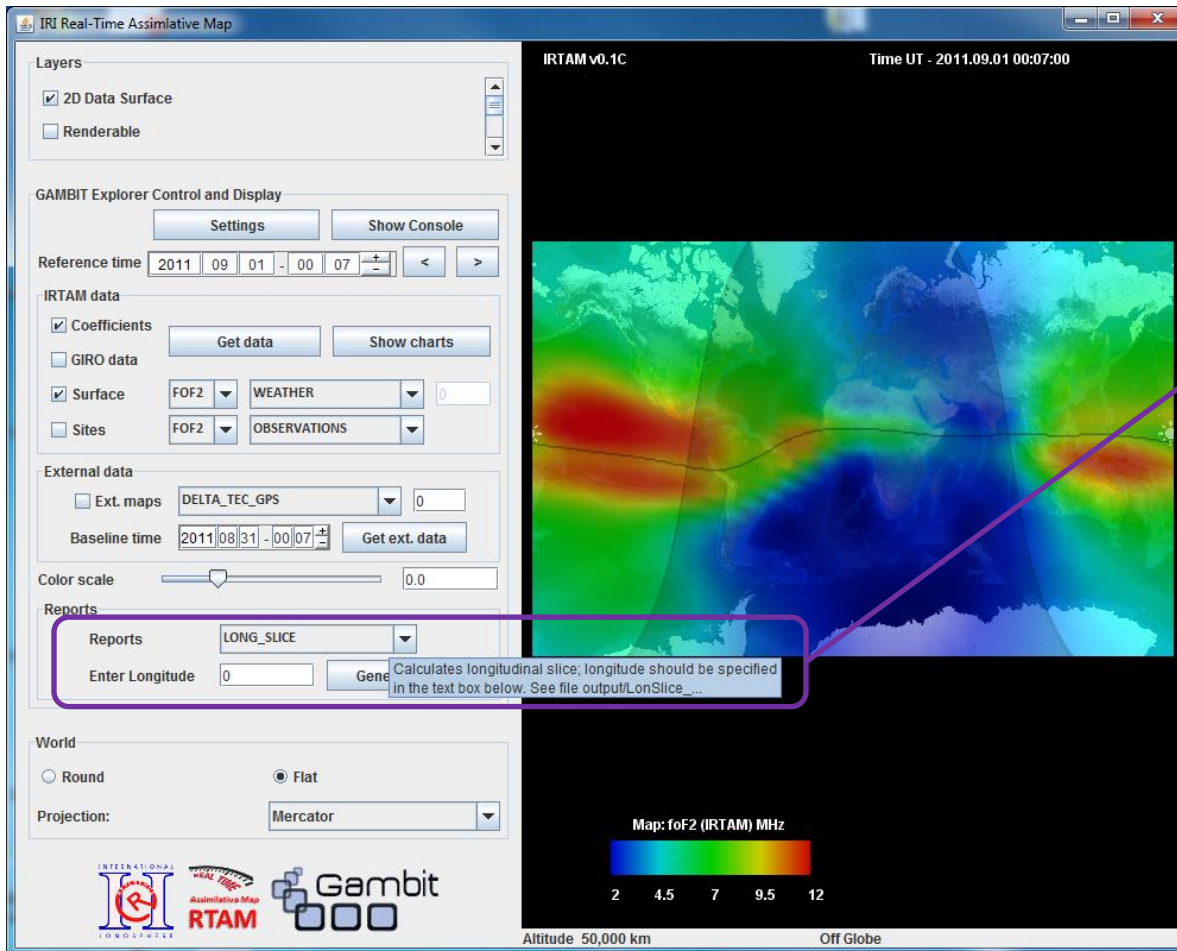
## DELTA GPS TEC



Plotting differential TEC maps is possible for comparisons with differential IRTAM “DELTA” displays.

The differential TEC maps are computed using TEC values taken at user-defined baseline time (presumably a quiet day). TEC values at baseline time are subtracted from TEC data at target time. **Note that target time is specified in the main window above.**

# Data controls: Reports.



Reports are useful to export data in different formats. Every report has a tool-tip descriptive information that pops up when the mouse pointer is placed on top of the report title in the menu. Report generation may require a user parameter specified in the text field.

Click **Generate** button to generate the report.

# Other Settings

Push **Settings** button to access different display and usability settings. Pop-up information explains what this setting affects. If checkbox is unchecked this means that the value for this setting is calculated automatically.