

Global Ionosphere Radio Observatory - GIRO



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The logo for the XIV International GIRO Forum (IGF 2014) features the text 'IGF 2014' in a large, blue, sans-serif font. The number '2' is replaced by a blue globe showing the Americas. The background of the slide shows a view of Earth from space, with the horizon line visible against a bright, hazy sky.

XIV INTERNATIONAL GIRO FORUM • 20-23 MAY

Outline

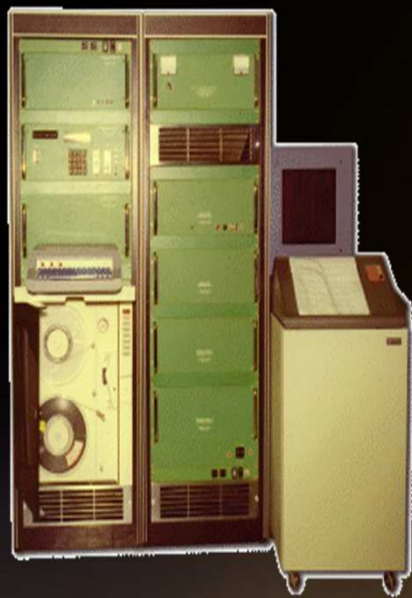
- Simultaneous Global Ionospheric Measurements with GIRO
 - GIRO Digisonde Network
 - Lowell GIRO Data Center
 - Sensors
 - Databases
 - Data Products
 - Examples

GIRO Digisonde Network



<3>

GIRO Sensors: Digisondes (mainly)



Digisonde 128
(1969)



Digisonde 256
(1978)



DPS4
(1993)



DPS4D
(2006)

Oblique Ionogram Studies with DPS4Ds



Real Time Assimilation into IRI Model

CLIMATOLOGY



Lowell GIRO Data Center (LGDC)



Updated
Coefficients:
988 foF2
988 hmF2

Weather

IRI
Real-time
Assimilative Model
IRTAM

GIRO



LGDC: GIRO Data Access & Analysis

- Digital Ionogram Database (**DIDBase**)
 - ❖ Public access to 17+ million ionograms
 - ❖ 79 Digisonde locations
 - ❖ Public access to 1+ million manually scaled records
- ❖ **SAO Explorer**
data analysis tool
- Plasma Drift Data Base (**DriftBase**)
 - ❖ Public access to 9+ million drift measurement records
 - ❖ 56 digisonde locations
 - ❖ 7+ million Doppler Skymap records
- ❖ **Drift Explorer**
data analysis tool

GIRO Portal → <http://giro.uml.edu>

GIRO

Global Ionospheric Radio Observatory (GIRO)
with Real-Time and Retrospective HF Ionospheric Sounding Data from Lowell DIDBase

Home Instrumentation Ionogram Data SAO Explorer Drift Data Drift Explorer

Welcome to GIRO

Map of GIRO locations (March 2010)

- ★ Real-time
- ★ Retro
- ★ Planned

- GIRO provides accurate specification of electron density in the Earth's ionosphere at >60 locations in the world
- 37 GIRO locations provide real-time ionospheric data to the central server in Lowell, Massachusetts within several minutes
- GIRO sites are equipped by [Digisonde](#) instruments that use high frequency remote sounding technique to probe bottomside ionosphere from 80 km up to the peak of ionospheric plasma density
- Real-time and retrospective data from GIRO locations are ingested in Lowell Digital Ionogram DataBase (DIDBase)
- GIRO data are opened for public access via [DIDBase Web Portal](#) and custom software tools for digisonde data analysis, [SAO Explorer](#) and [Drift Explorer](#)
- Please make sure to read [Rules of the Road](#)

DIDBASE
GIRO WEB PORTAL

LATEST WORLD IONOGRAM

LATEST 24-HR MOVIES

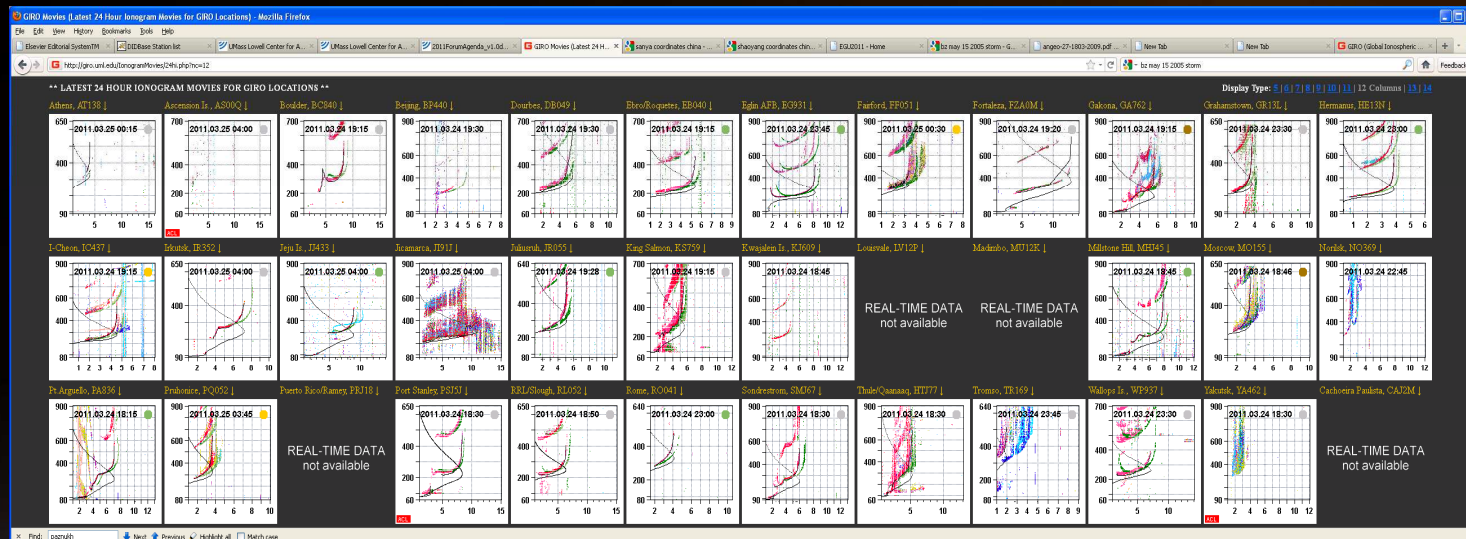
GIRO MONITOR

DIGISONDE PRIMER

UMASS LOWELL

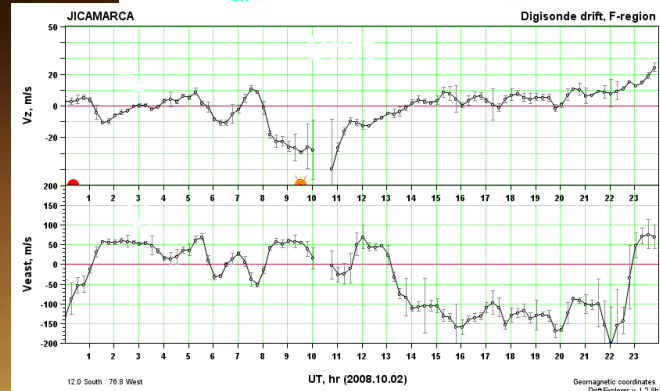
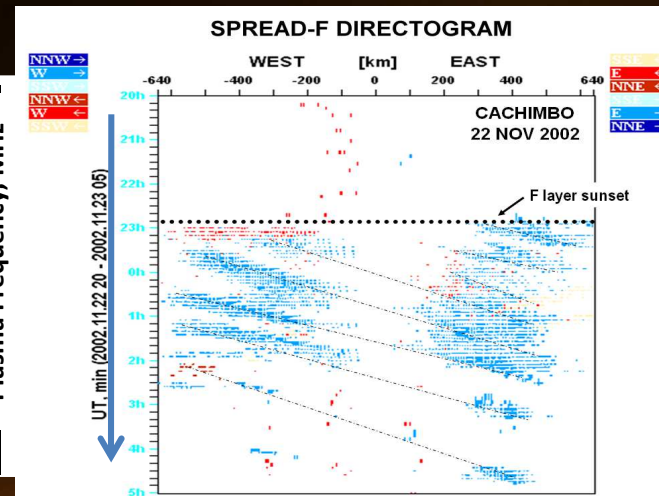
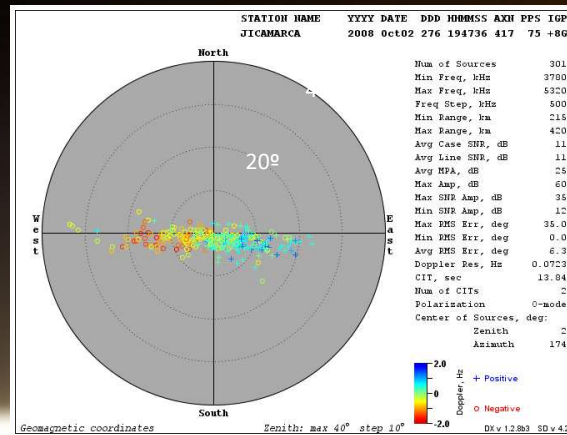
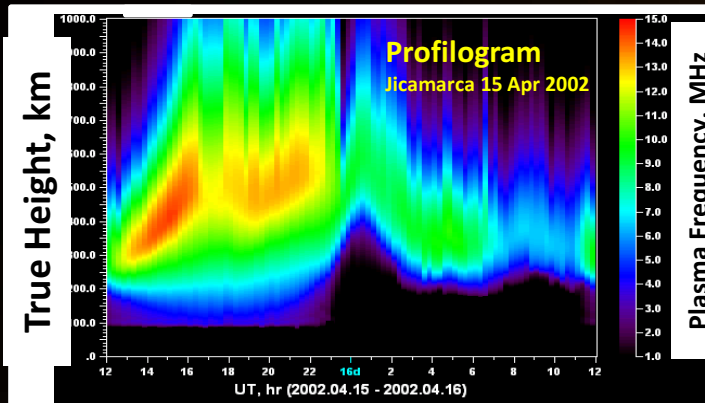
UMLCAR

<http://giro.uml.edu/lonogramMovies>



- **24-hour ionogram animations**
- **Agreements with Digisonde host organizations on real-time data delivery**
- **Assimilation of data in GAIM, DIAS-project, ESPAS, and now IRTAM**
- **Development of Real-time IRI extension**

Other Data Products



Profilogram example

