



Use Case 6: IRTAM and RayTRIX

WITH DEMO



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IRTAM and RayTRIX, part of RION



- Realistic Ionosphere (RION) is a *Project*
 - GIRO
 - DIDBase (with SAO Explorer)
 - DriftBase (with SkyLITE)
 - GAMBIT (with IRTAM and GIM results)
 - TIDBase and Explorer
 - LOUISA
 - RayTRIX

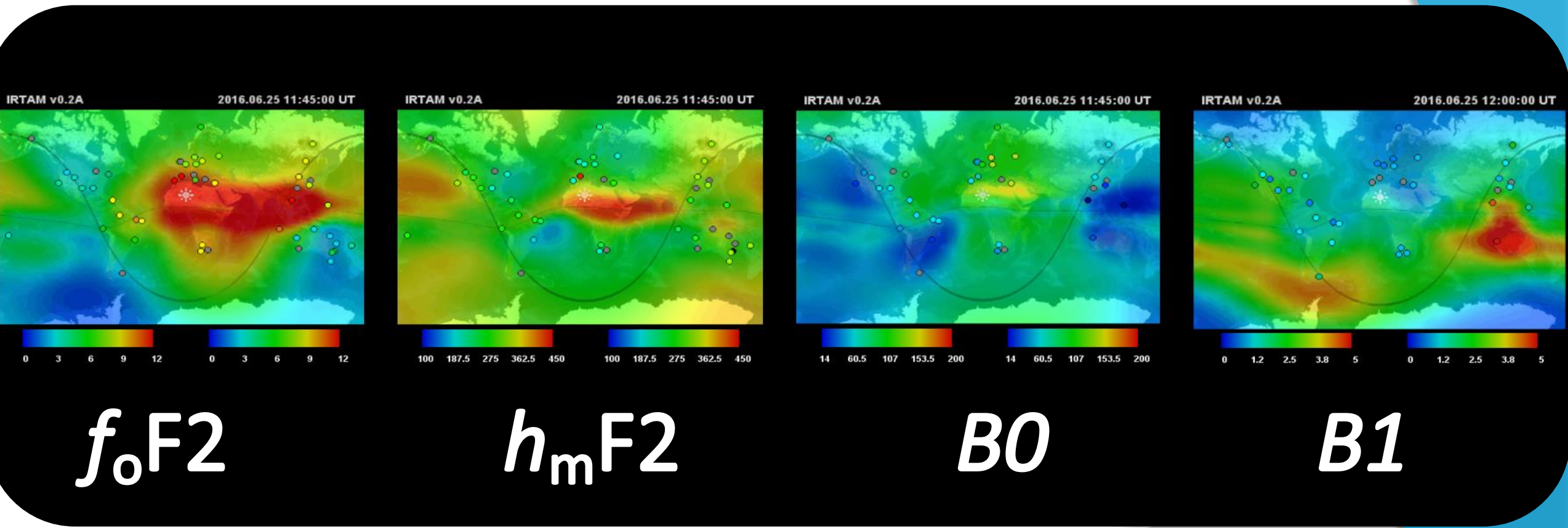
Realistic Ionosphere

RION is member of United Nations Space Weather Initiative
<http://www.iswi-secretariat.org/>

September 1-17, 2020

GIRO	IRTAM 3D	SkyLITE	TID Explorer	RayTRIX	IDI
Measurements	Global Model	Plasma Drifts	TID Warnings	Raytracing	Disturbance Indicator

IRTAM: ionospheric weather nowcast



f_oF2

h_mF2

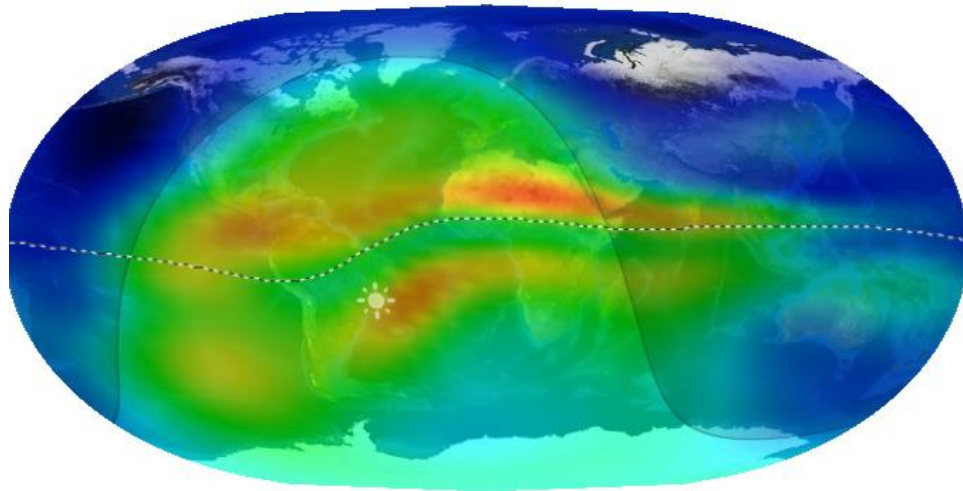
$B0$

$B1$

Anomaly maps of MUF(3000) from IRTAM

IRTAM v0.3A : guest

2009.01.23 15:00:00 UT

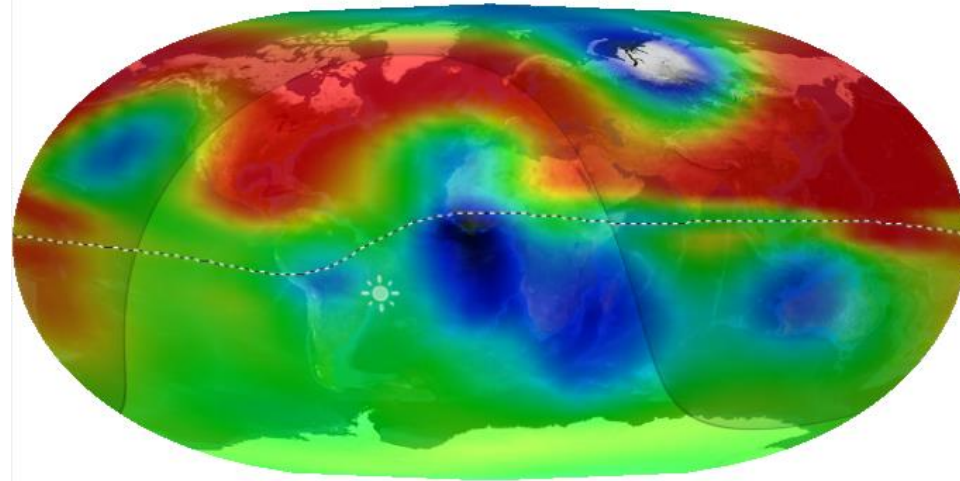


Map: MUF3000 (IRTAM) MHz
3.3 10.7 18.1 25.6 33

MUF3000 weather map

IRTAM v0.3A : guest

2009.01.23 15:00:00 UT



Map: Delta-MUF3000 %
-20 -10 0 10 20

Δ MUF3000 anomaly map



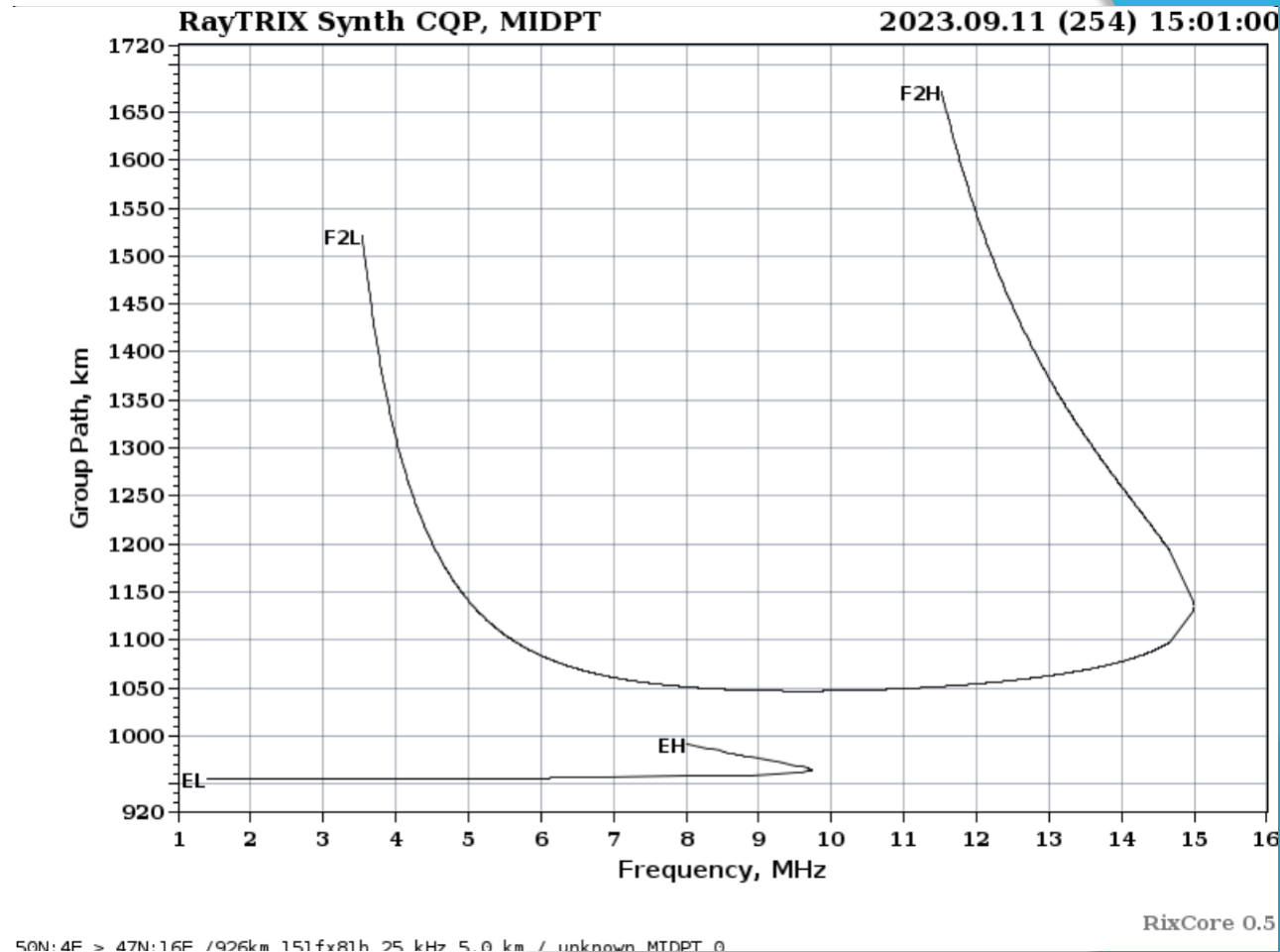
IRTAM Registration ToDo



- ◉ Register Interaction methods for all IRTAM products
 - Animation GIFs of the latest 24-hour ionospheric weather
 - Maybe something more sophisticated than GIFs?
 - 24-hour Local Weather charts
 - Proven useful for HAM Radio folks
 - Download of GAMBIT coefficients (numerical)
 - These are just coefficients (compact representation)
 - GAMBIT Explorer is needed to look at the maps or produces grids
 - So, add online 2D gridding to eSC?
 - That would be 96 x 45 x 46 doubles

RayTRIX: HF signal propagation

- Provides signal propagation computation
 - any radio link, any time
 - using IRTAM weather
 - Great for accurate MUF weather
 - ICAO!
 - Support civil aviation operations on ground-to-aircraft HF radio links



RayTRIX is a GPU system

- Runs on a Tesla P100
- One computation ~ 5 sec
- A small GPU farm would be sufficient to handle ICAO tasks
- eSC could be a demo platform for this capability

- Advanced topic: concurrency issue with multiple runs!

