Access to NOA node

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Description of the infrastructure (I)

The National Observatory of Athens (NOA) conducts ionospheric sounding measurements providing data and products to research community.

Athens Digisonde-Portable-Sounder-4D (DPS4D)

URSI code: AT138

Location: Penteli (Athens) Greece (GEO 38.0° N, 23.5° E)

Control and Data Platforms: LINUX and Windows 8.1, respectively

Transmitter Cards that support the signal processing of short-pulse waveform and long-pulse waveform

Frequency scan: 0.5 – 30 MHz

Data archiving: SAO, SAOXML, RSF/SBF, SKY, DVL, TLT

http://195.251.202.49/

Geometry of the Athens DPS4D installation

Build-in Software

- ARTIST 5.0 – ionogram scaling
- DFT2SKY – Skymap calculation
- DDAV – Calculation of drift velocity
- DRGMaker – Calculation of directogram
- TILT – Calculation of ionospheric tilt
- Online image tools – production of images

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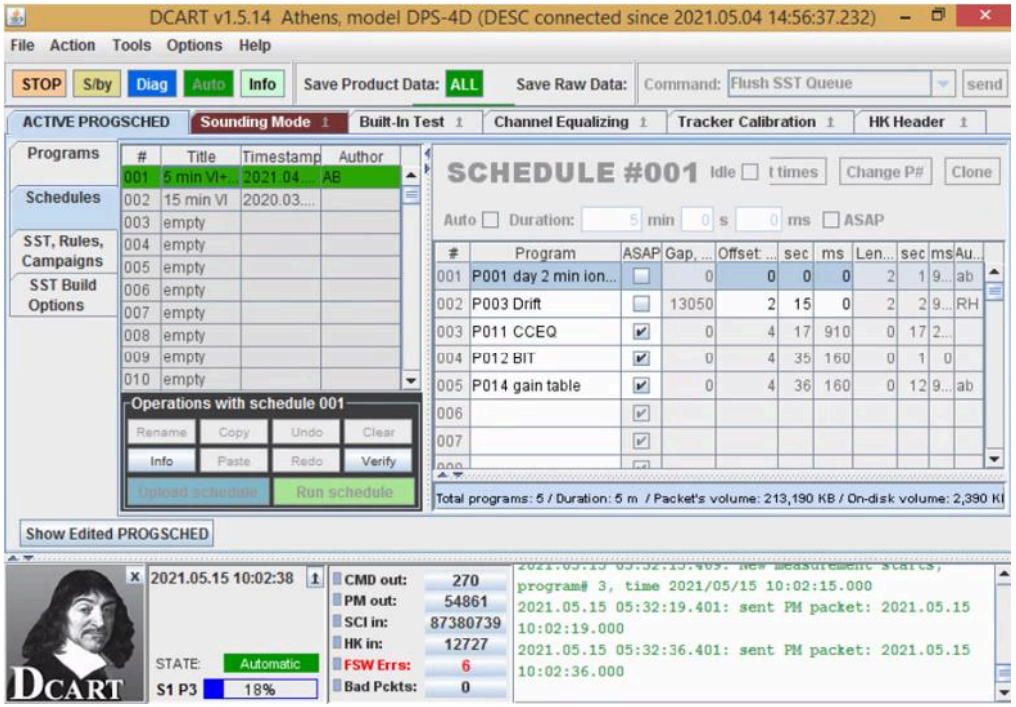
Description of the infrastructure (II)



DCART (Digisonde Commanding and Acquisition Remote Terminal) application allows the selection of the sounding parameters

Athens DPS4D experiments

Standard mode

- Vertical soundings every 5 min (carried out routinely): scanning ionogram; F-region drifts

Special modes

- Vertical soundings: fixed-frequency ionogram; E-region drifts.
- Bi-static oblique soundings jointly with one or more Digisonde systems (Digisonde-to-Digisonde operation)
- Programmable selection of frequencies or frequency bands
- Flexible scheduling of sampling cadence

Access to NOA node

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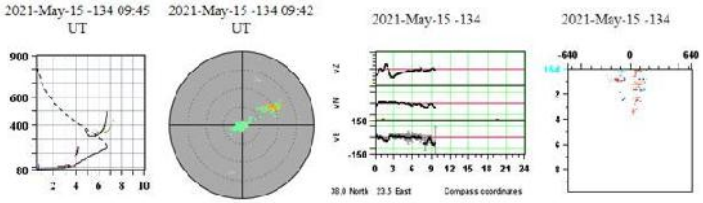
Products/Models (I)

Digisonde related data and products

- Ionospheric echoes parameters: Amplitude, phase, direction of arrival, virtual height, Doppler frequency & spread, ordinary & extraordinary wave polarization identification.
- Ionospheric electron density profiles; ionospheric characteristics including foF2, foF1, foE, foEs, MUF(3000)F2, hmF2, hmF1, hmE and the IRI parameters B0, B1 and more (49 in total). *Data archiving: SAO, SAOXML*
- Ionosphere visualization products: Ionograms; Skymaps; Drift velocity plots; Directograms



- Near-by GNSS (Global Navigation Satellite System) data:

PENT Equipment TOPCON Net-G3, sampled with 30 or 1sec, with data, in tps, RINEX or RTK
NOA1 sampled at 30sec, in daily RINEX

Athens Digisonde distance from PENT and NOA1 at 200m at an azimuth of -170°. Other close stations include:

GNSS	Distance (km)	Azimuth (°)
MET0	9.5	-80
DION	6.7	62
DYNG		
RAFI	13	105
ATHI	19.4	-131
KERT	29.1	160

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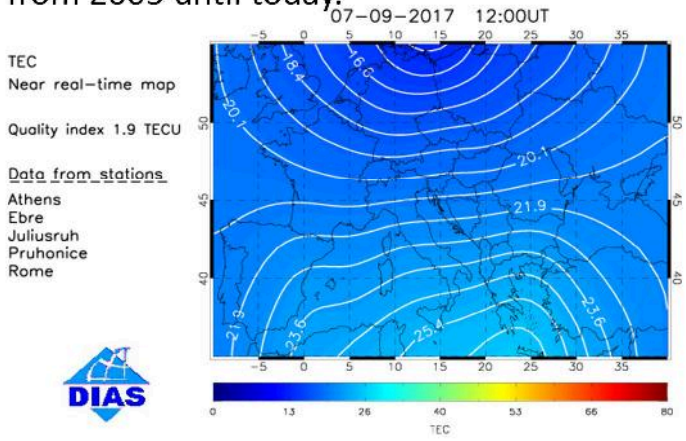
Products/Models (II)

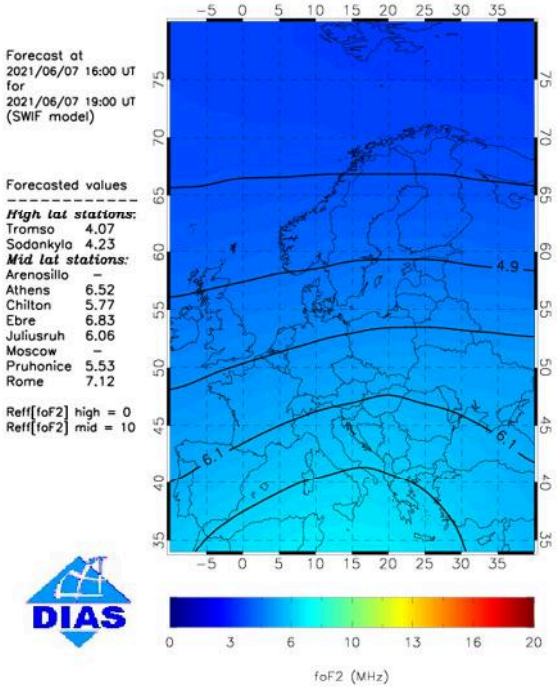
Ionospheric predictions

The **European Digital Upper Atmosphere Server (DIAS)** e-infrastrure operated by NOA delivers nowcasts, as well as short- and long-term predictions of ionospheric characteristics over Europe based on the implementation of ionospheric prediction models. The DIAS database contains data and model results from 2005 until today.



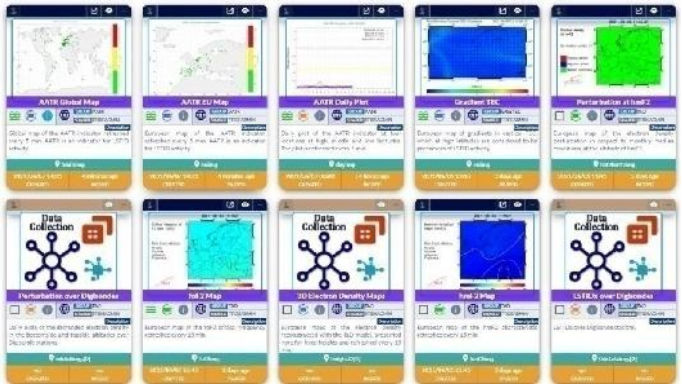
An example of DIAS TEC maps

http://dias.space.noa.gr



An example of DIAS forecasting maps

Detection and prediction of TIDs



The **TechTIDE-EC H2020 warning system** e-infrastructure provides detection and prediction of Travelling Ionospheric Disturbances (TIDs) over Europe and Africa, based on several complementary methodologies. The TechTIDE database contains data and model results from 2017 onwards.

http://www.tech-tide.eu/

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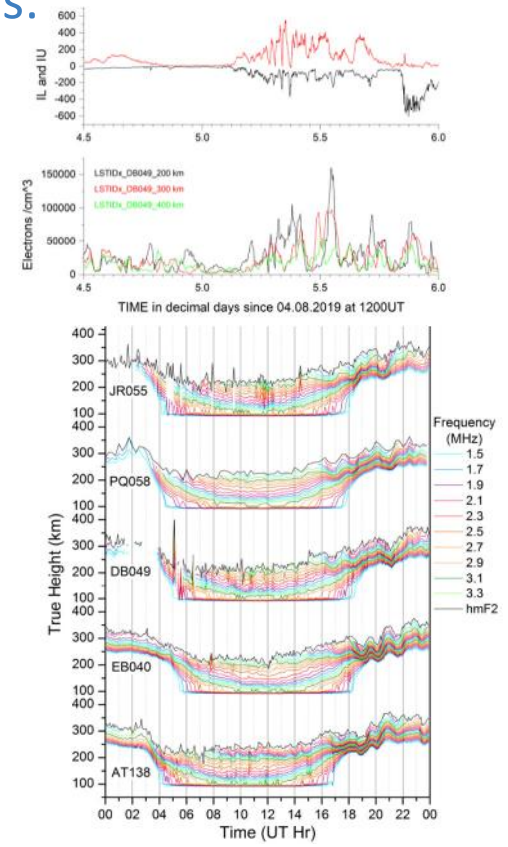
NOA node is open to experiment proposals in the following fields:

- Ionospheric forecasts driven by solar wind predictions
- Validation of ionospheric specification models based on standardized methodologies
- Modeling the propagation pattern of ionospheric irregularities in the bottomside and topside ionosphere
- Ionospheric reconstruction profilers ingesting ground and space-based observations
- Identification and propagation pattern of Travelling Ionospheric Disturbances (TIDs)
- Digisonde experiments
  - Vertical Soundings
  - Joint experiments/special campaigns with bistatic HF sounders' operations.



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Commitments for granted TNA projects

NOA commitments

- Physical access
  - Offering travel to the site location and one week of accommodation.
- Remote access
  - Weekly scheduled interactions during one month
- Hands-on support at site for running experiments, analysing, database searching etc.
- Remote support during the whole project

User commitments

- Present scientific results and findings in a written report at the end of the project, maximum 6 months.
- Submit an evaluation of the project experience.