# 2018 Space Weather Activities in Ukraine

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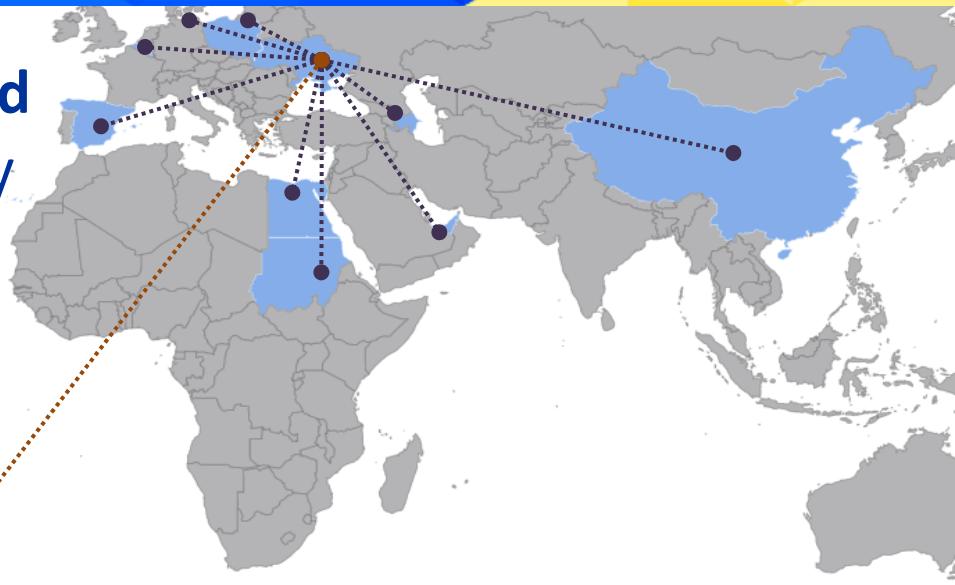
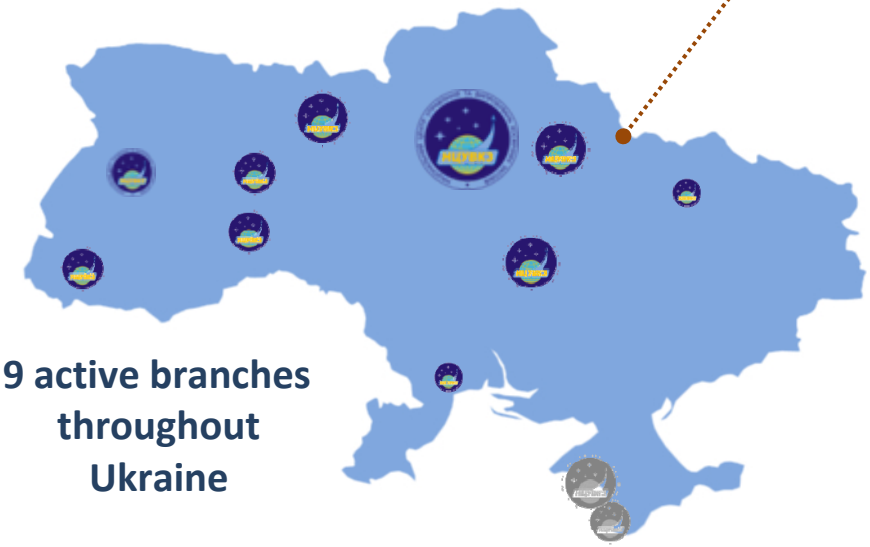
# Introduction



**National Space Facilities Control and Test Center** is an operational agency under SSAU responsible for:

- **Spaceflight control and comms**
- **Analysis of remote sensing data**
- **Navigation and time service**
- **Space situational awareness**
- **Geophysical monitoring**





**9 active branches throughout Ukraine**

Operational space weather activities are handled by **Main Center of Special Monitoring**, one of 9 branches of NSFCTC

# Operations

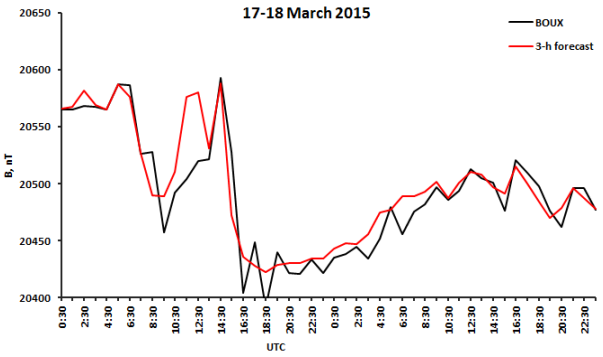


- Space weather operations started Feb. 2018
- NOAA alerts are relayed with correction for geomagnetic latitude
- Post-event analysis is performed using local measurements from:
  - 2 magnetic stations (Malyn, Kamianets-Podilskyi), Main Center of Special Monitoring
  - 3 Intermagnet magnetic observatories (Kyiv, Lviv, Odesa), Subbotin Institute of Geophysics
  - 1 meteomagnetic station (Kharkiv), Institute of Radio Astronomy
- These products are delivered daily to the Main Situational Center of Ukraine
- The construction of a new operational room is in progress
- New operational products are in development

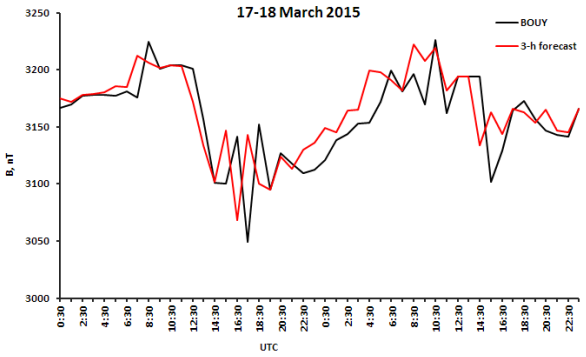
# Local geomagnetic forecast



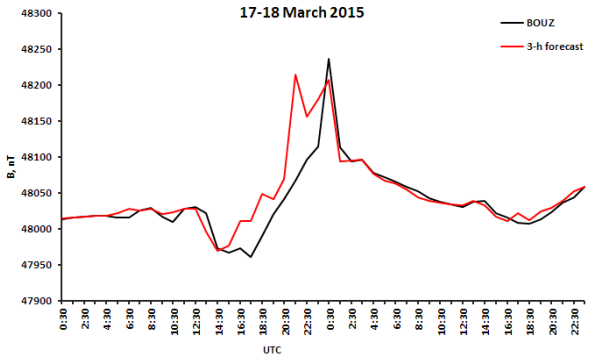
- New product, no known alternatives
- Directly predicts magnetic components at an observatory
- Lead time: 3 hours + propagation time from L1
- Currently available for 3 magnetic observatories: Lviv (Ukraine), Boulder (USA), and Chambon-la-Forêt (France)
- Developed by the Space Research Institute
- Example output for the 2015 St. Patrick's storm (Boulder): black is measurements, red is forecast 3 hours ahead




X (northward)



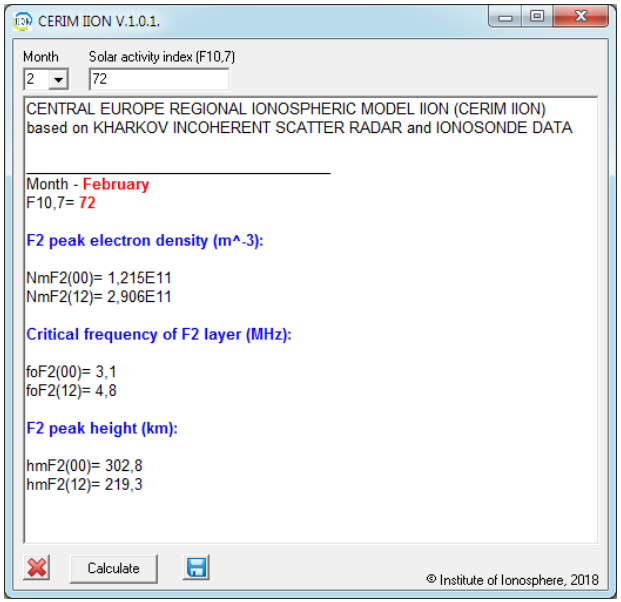

Y (eastward)




Z (downward)

# CERIM-IION

- Updated product
- Provides background noon and midnight values of
  - critical frequency (foF2),
  - maximum electron density (NmF2), and
  - height of the maximum electron density layer (hmF2)
- Developed by the Institute of Ionosphere
- Example output for February 2019:



# Thank you!

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