

IONOSPHERIC DISTURBANCES IN NORTH EASTERN REGION OF ASIA DURING LOW SOLAR ACTIVITY PERIOD

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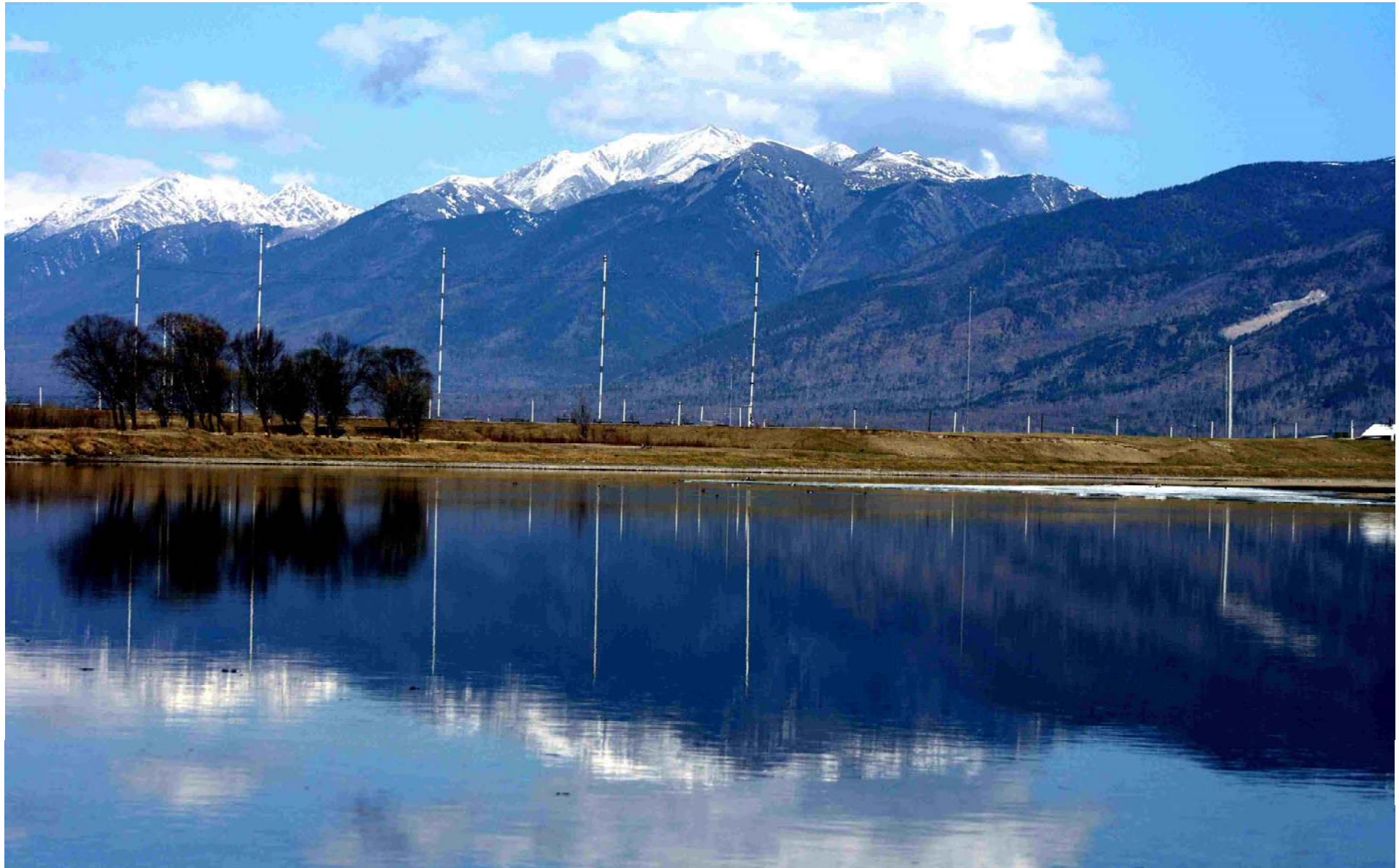


This instrumental complex let us to research the ionosphere over extensive Russia region from subpolar to middle latitudes into longitudinal sector 90-150°E. We could observed the ionosphere responses both to extreme geomagnetic storms for Solar Cycle-23 and under quiet geomagnetic condition.



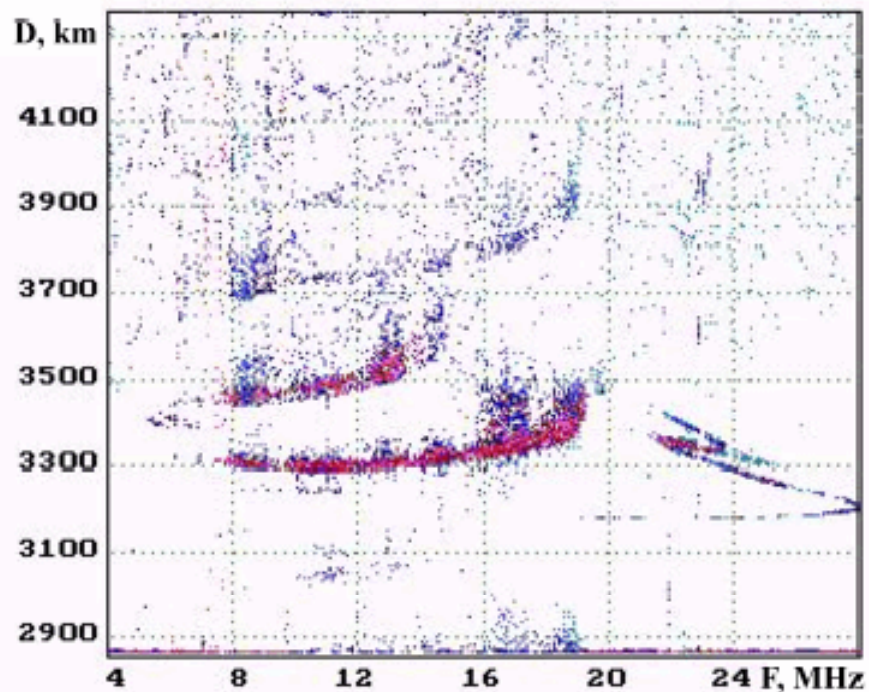
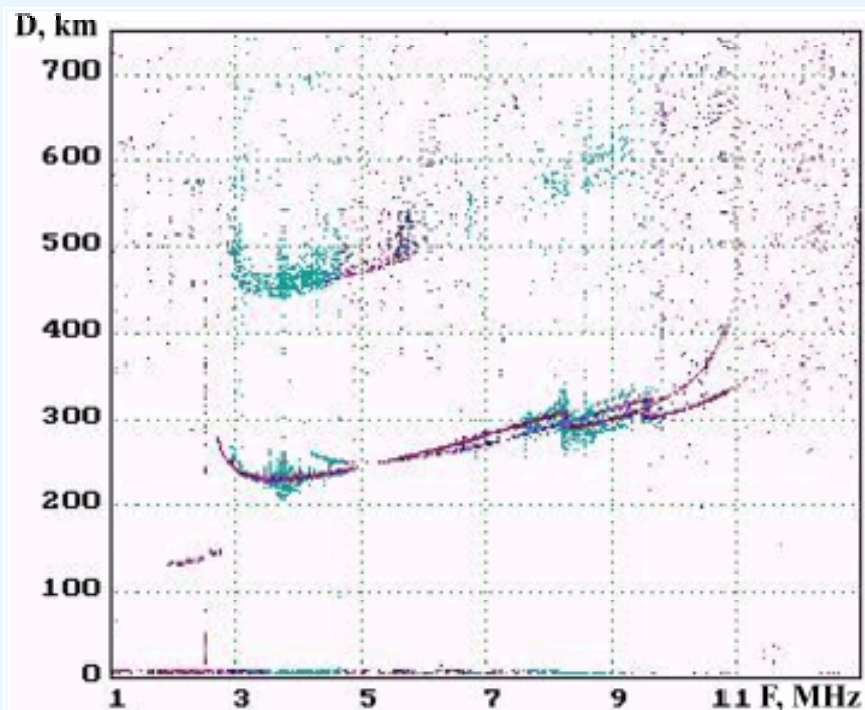
GEOPHYSICAL OBSERVATORY

v.Tory (Buryatia)



Main specification of chirp sounder

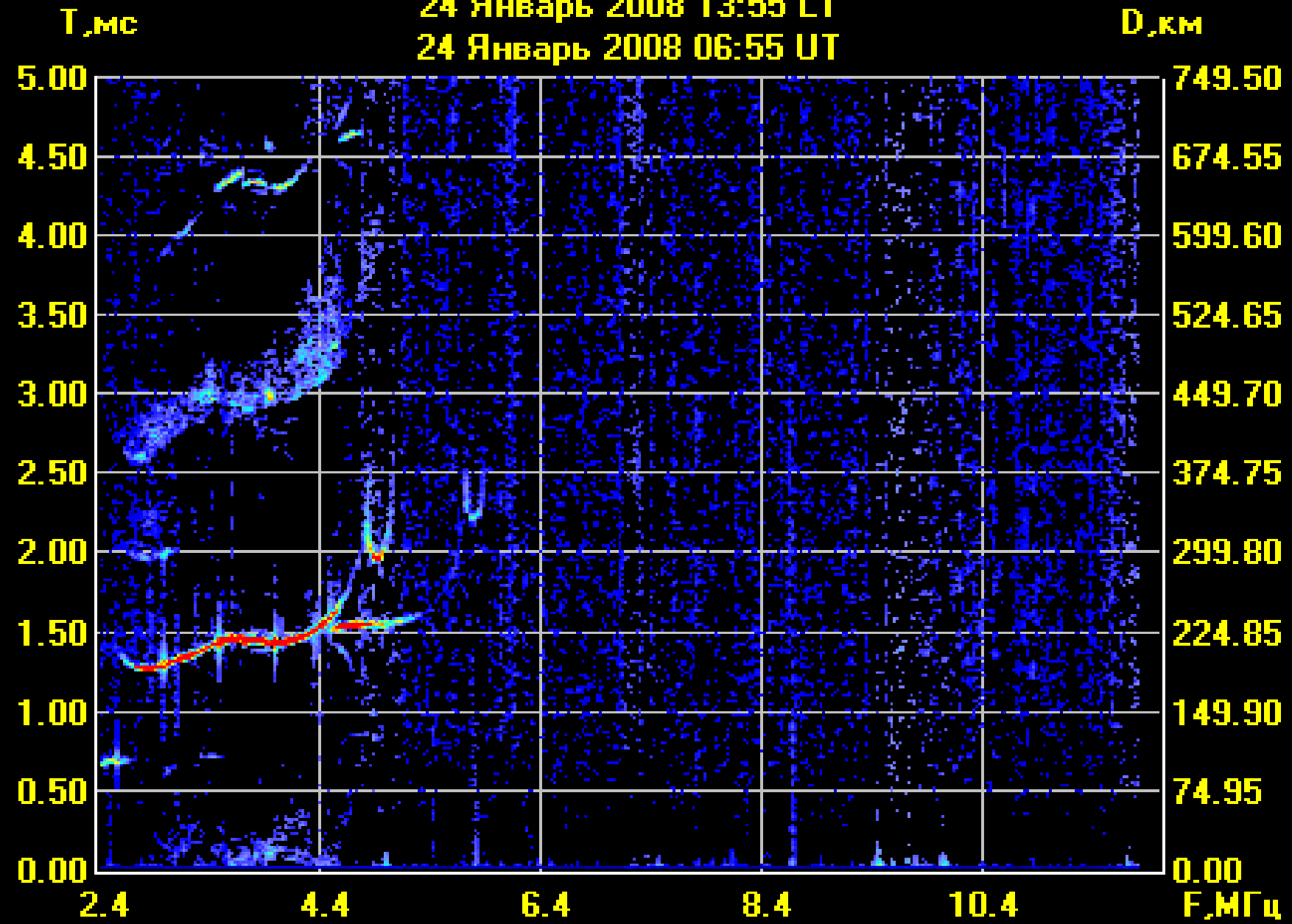
Sounding frequency range. MHz	1.0 – 30.0
Frequency-sweep rate. kHz/s	10 – 10000
Frequency resolution, kHz	20
Delay resolution, km	1.5
Distance of sounding, km	100 - 40000

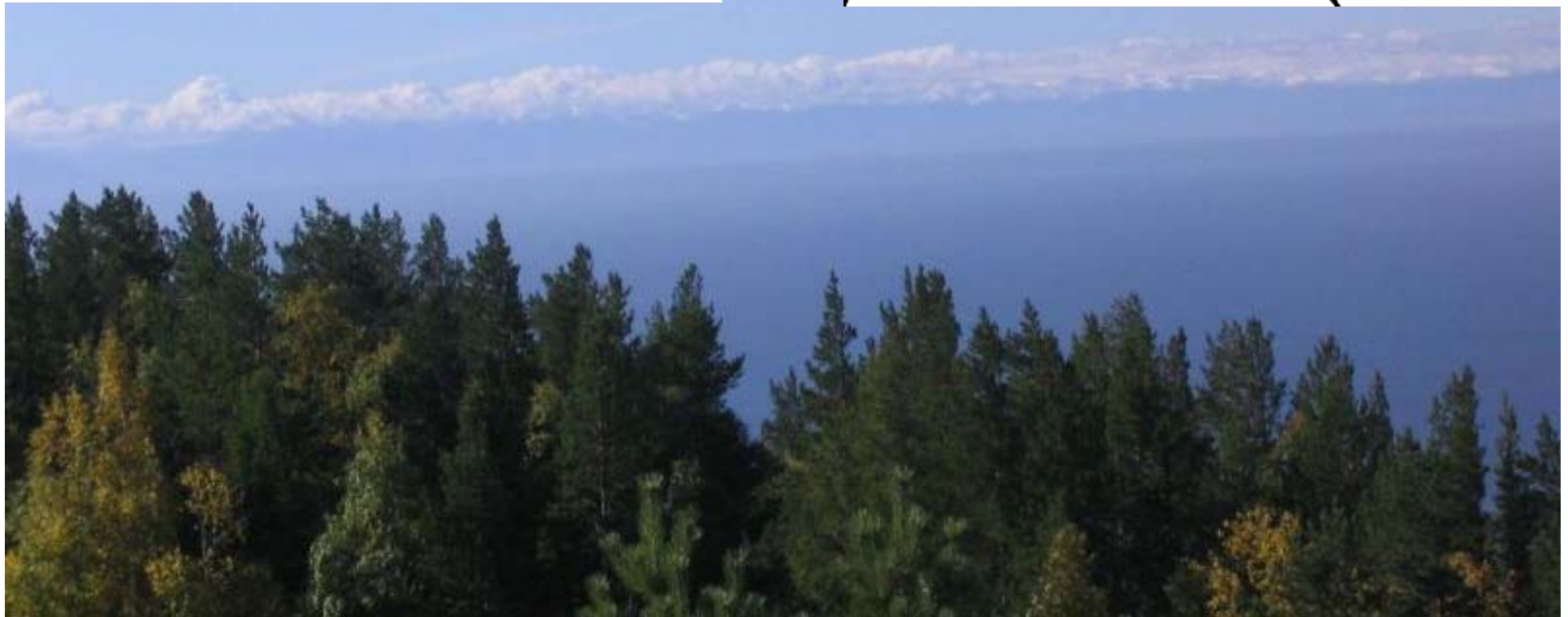
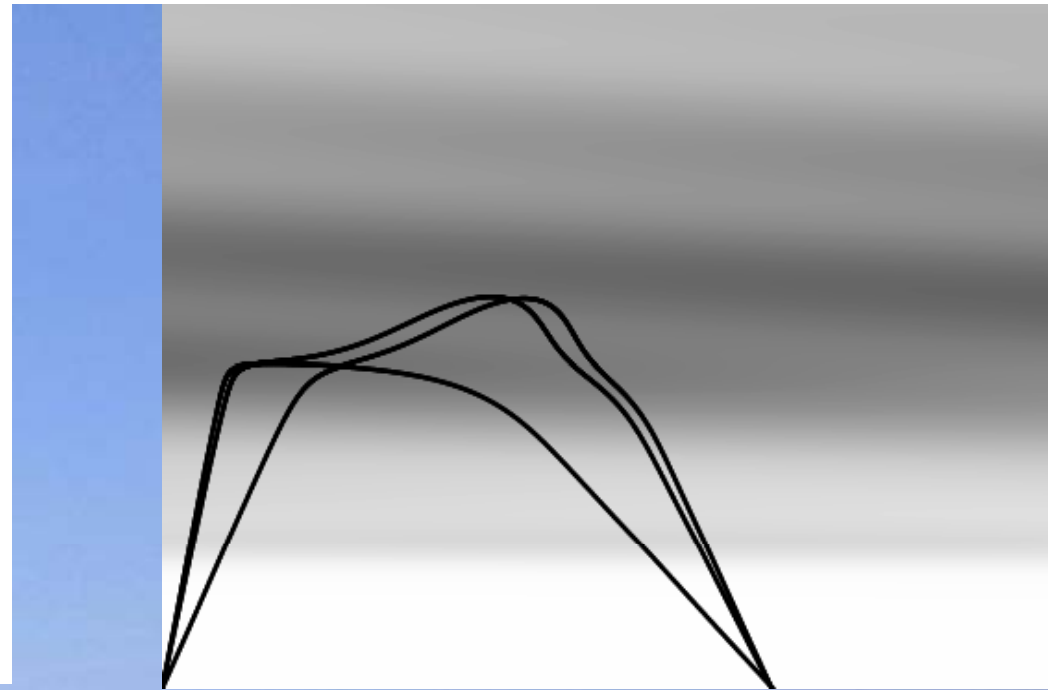
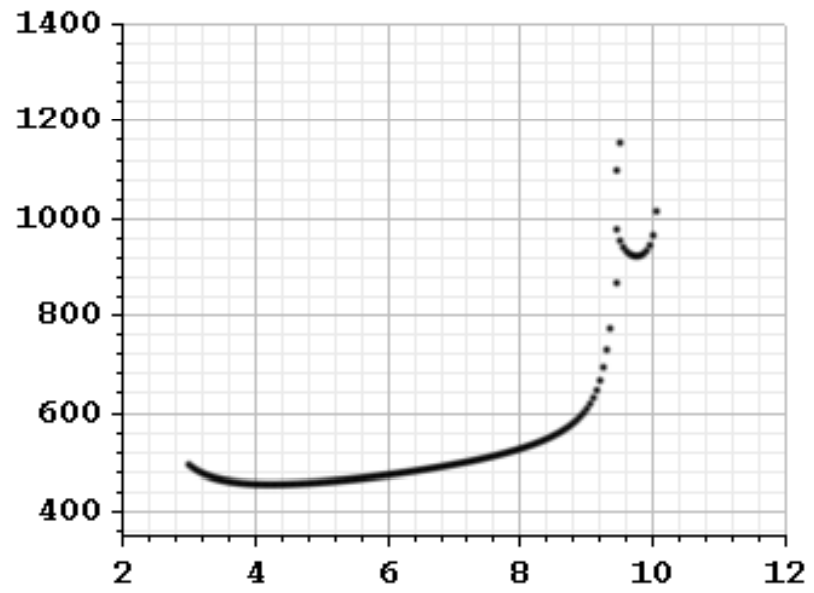


Усолье-Торы

24 Январь 2008 13:55 LT

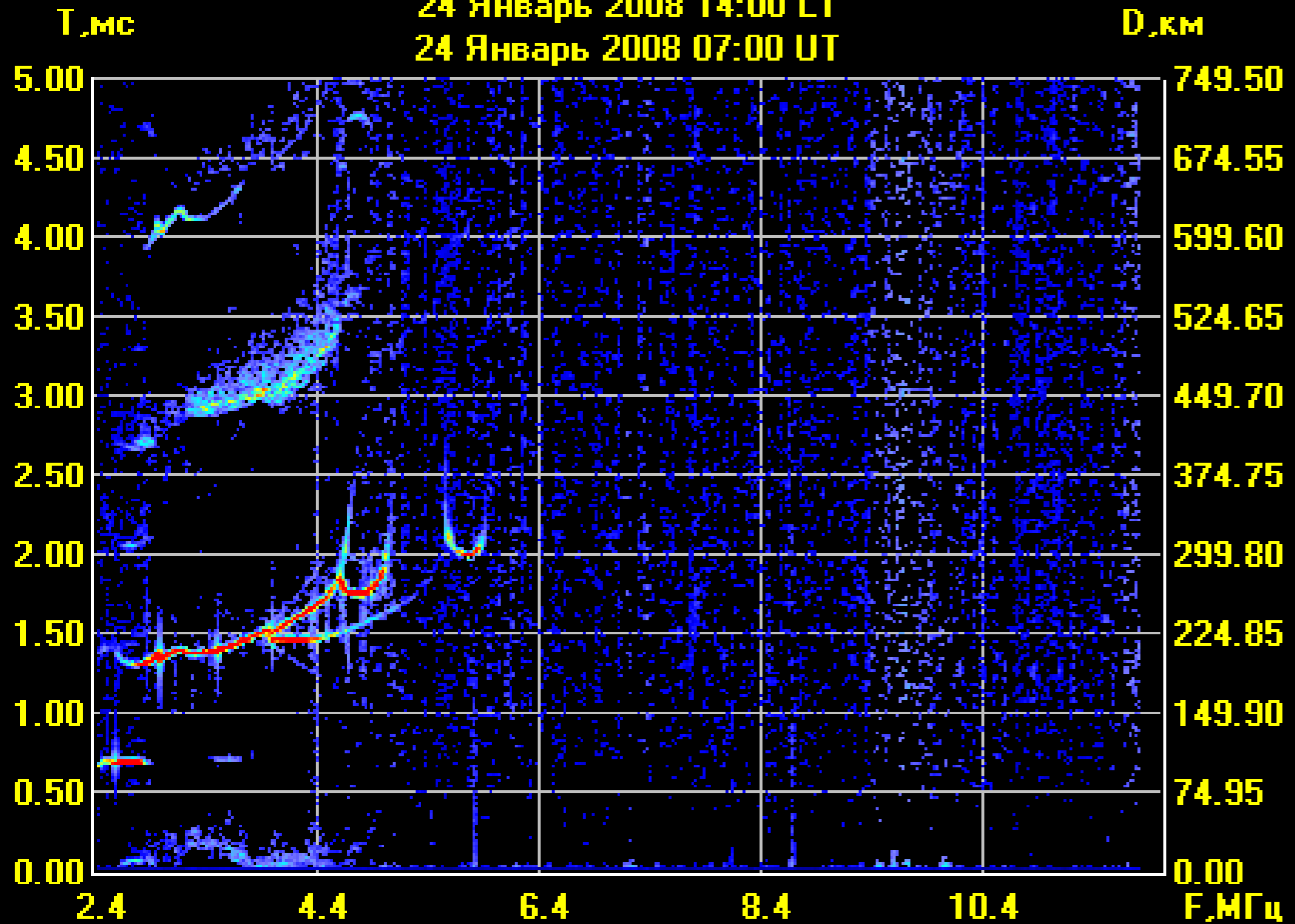
24 Январь 2008 06:55 UT

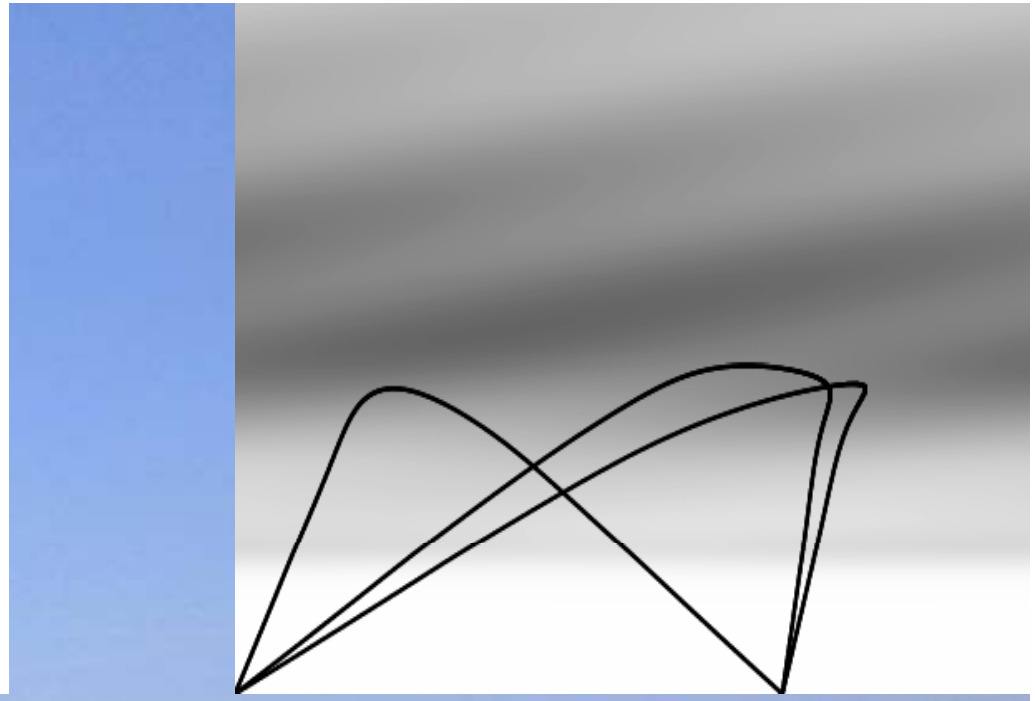
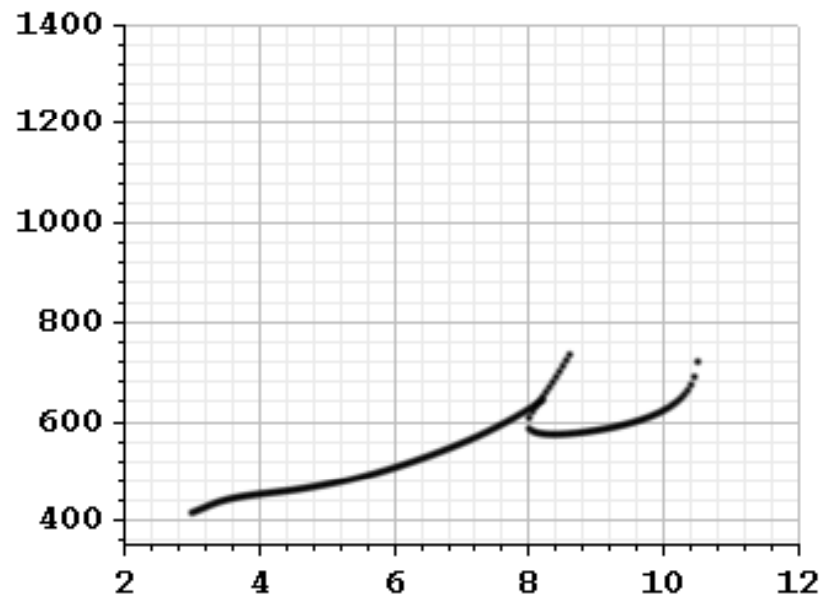




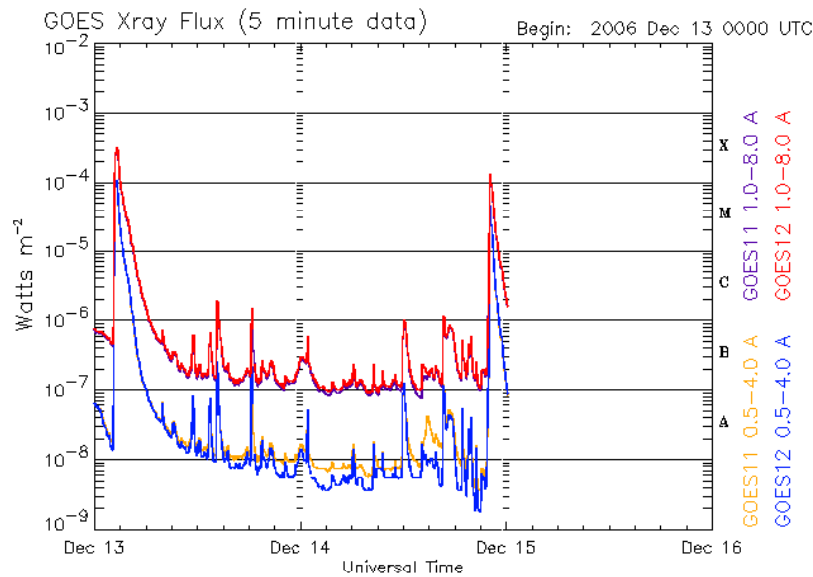
Усолье-Торы

24 Январь 2008 14:00 LT
24 Январь 2008 07:00 UT



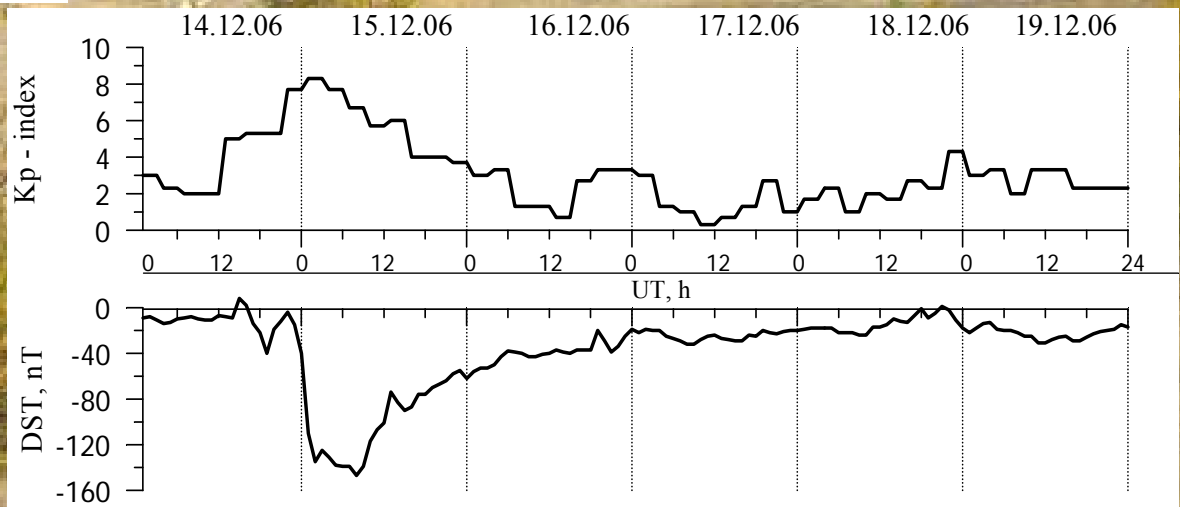


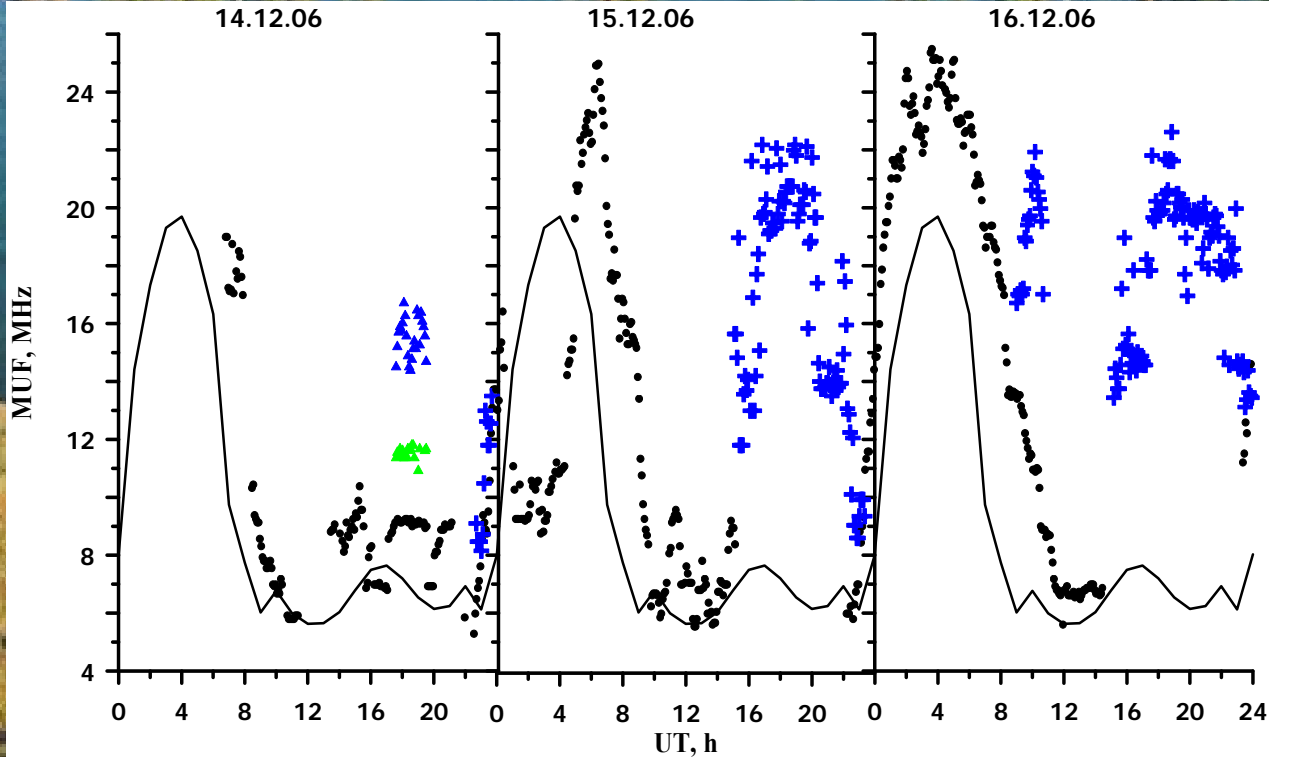
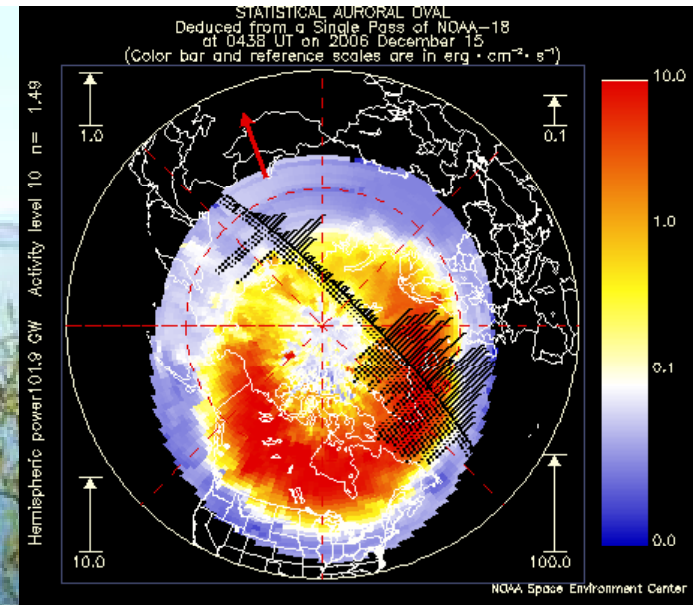
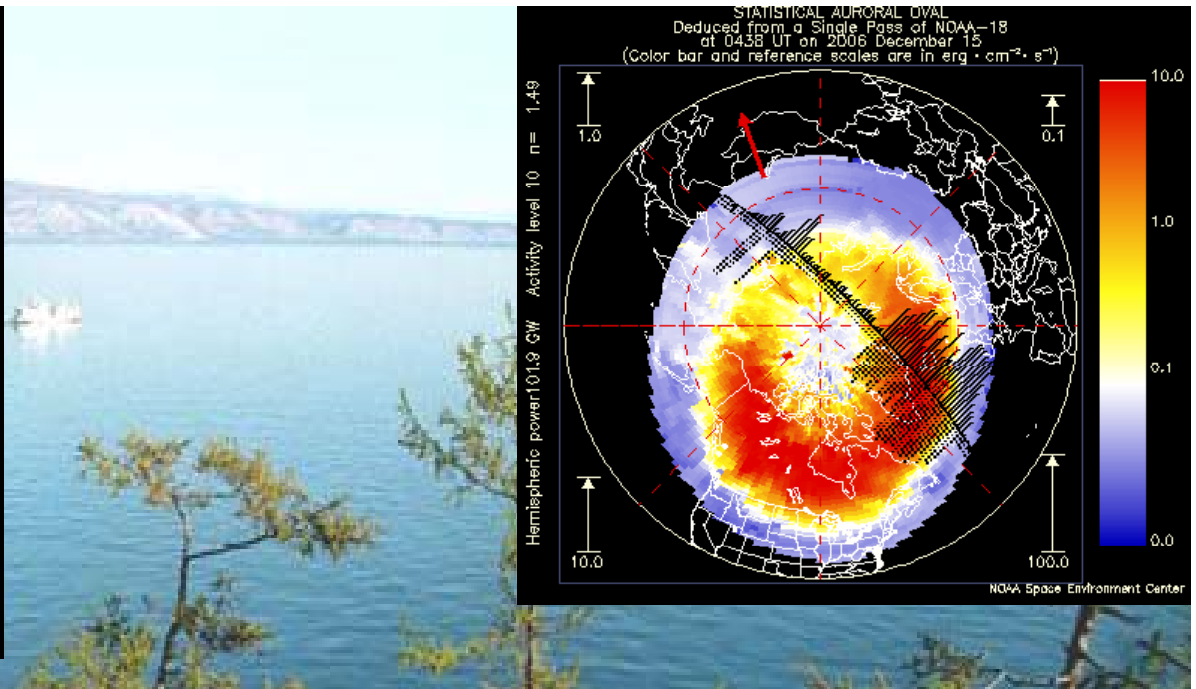
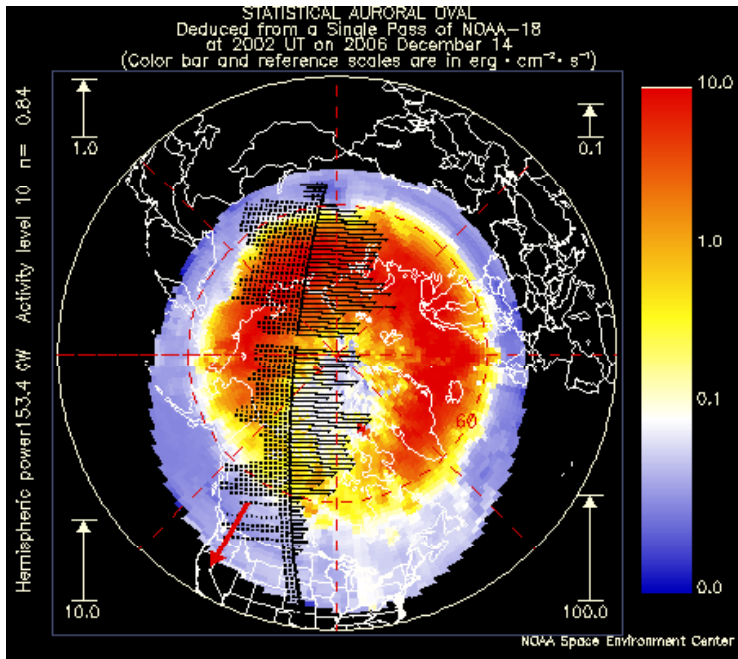
Last solar extreme events in December 2006 were characterized by a high flare activity. Some optic and X-ray flares including four X-class flares were recorded from 5th to 7th and from 13th to 16th December, 2006.

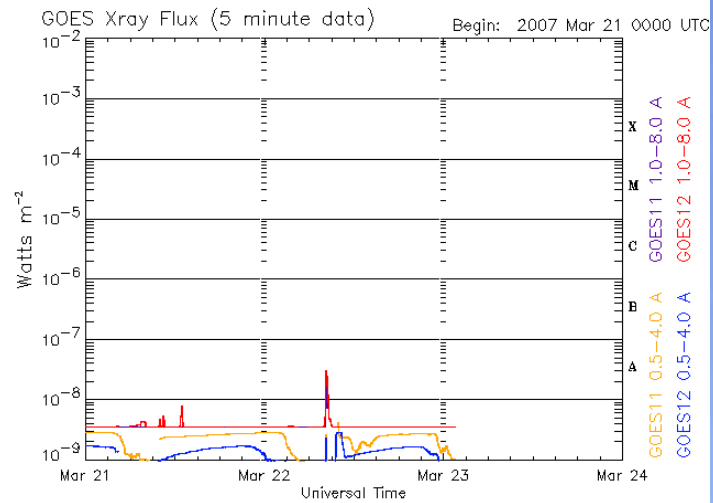


Updated 2008 Dec 15 00:21:05 UTC

NOAA/SEC Boulder, CO USA

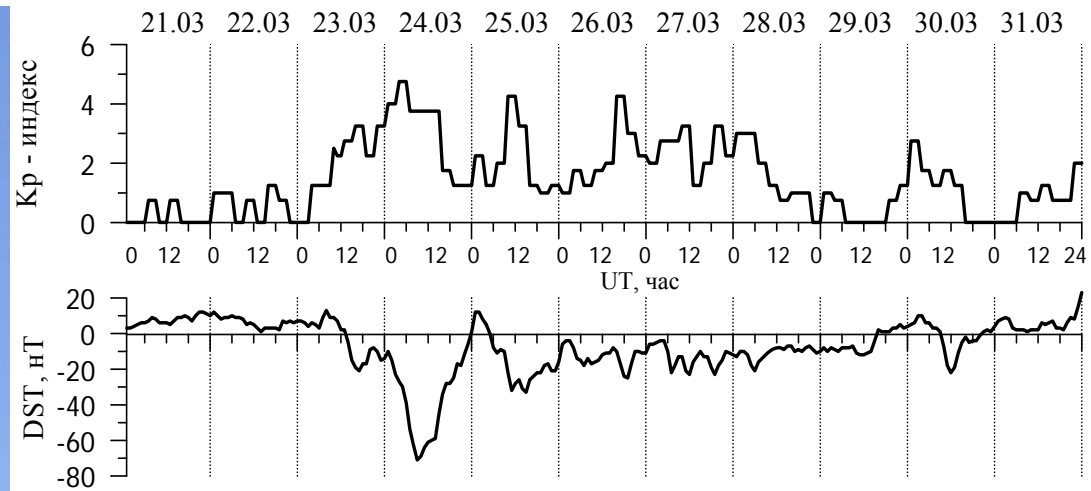


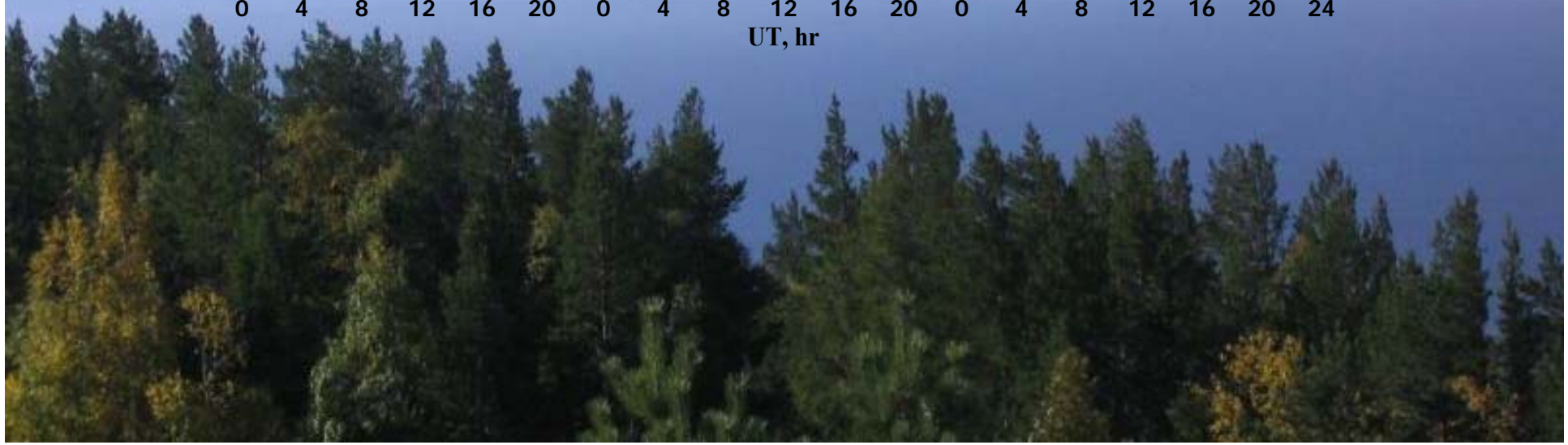
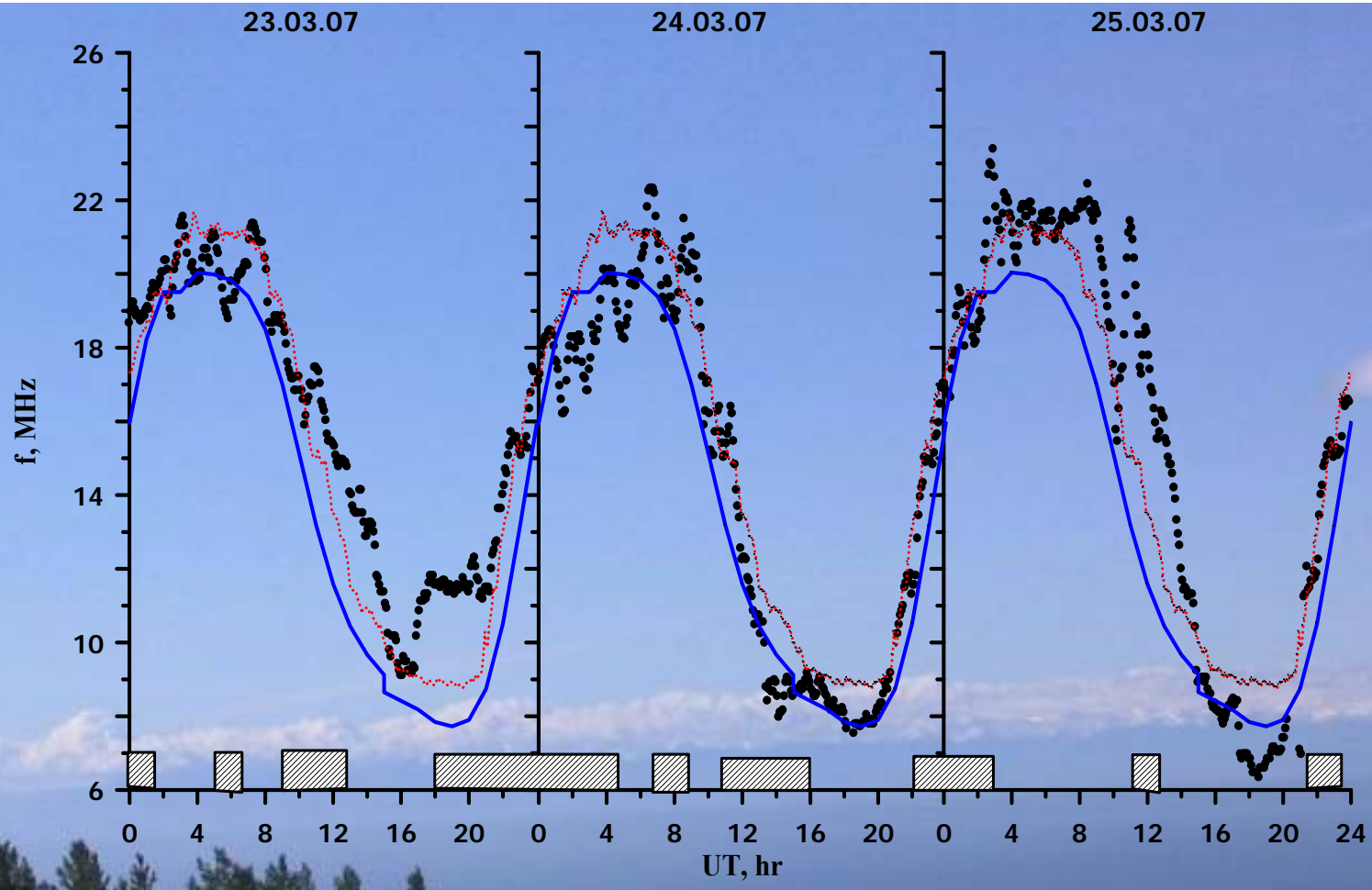


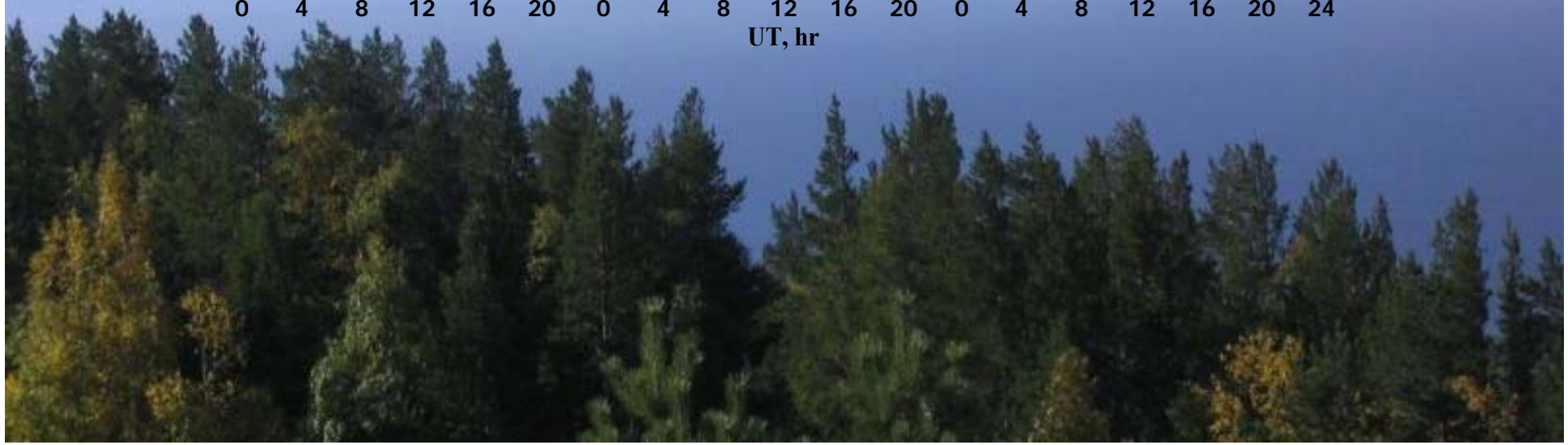
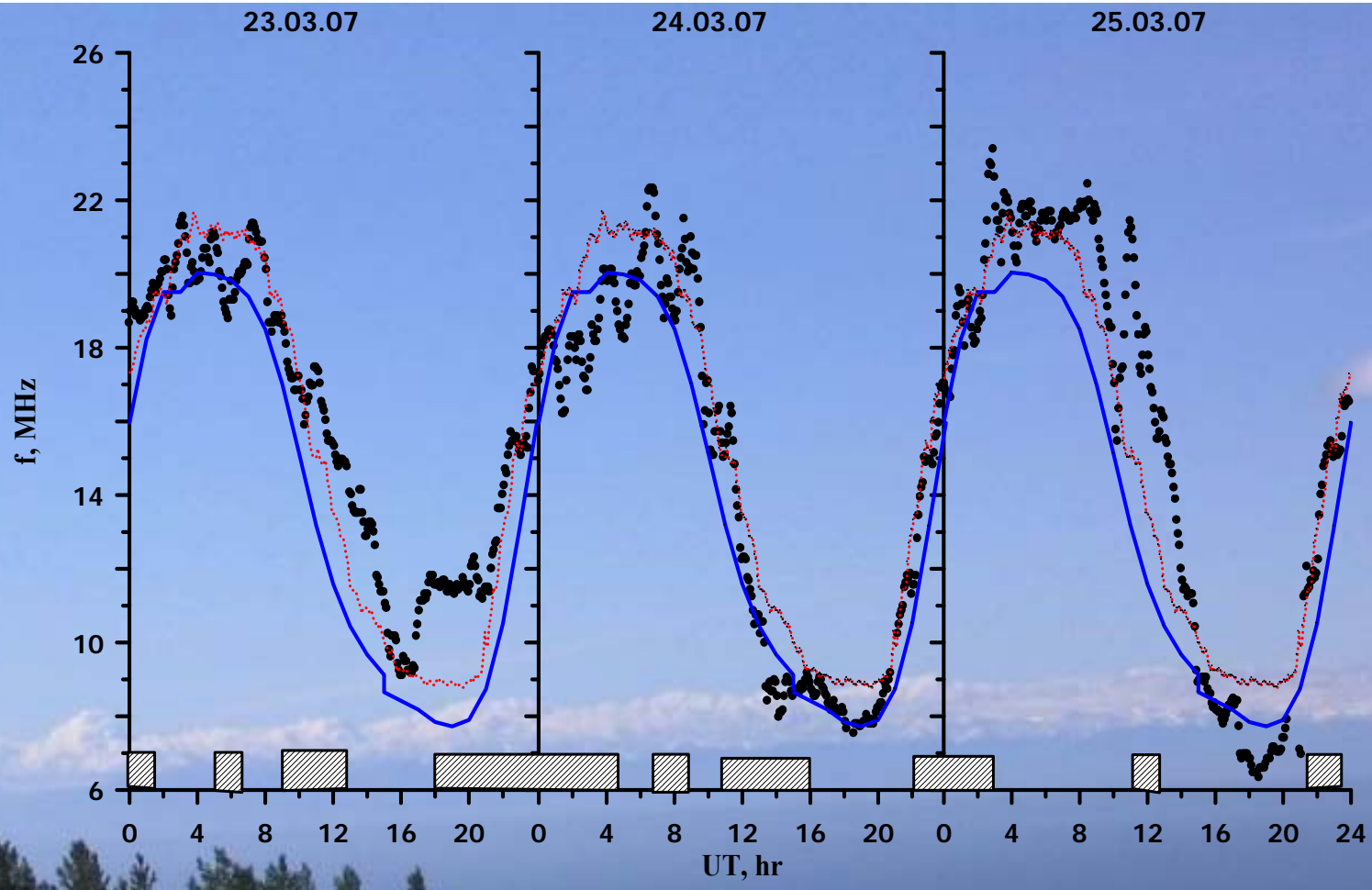


Updated 2007 Mar 23 01:36:04 UTC

NOAA/SEC Boulder, CO USA





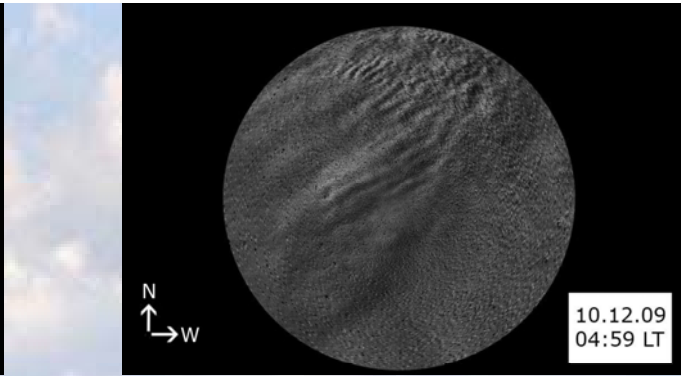
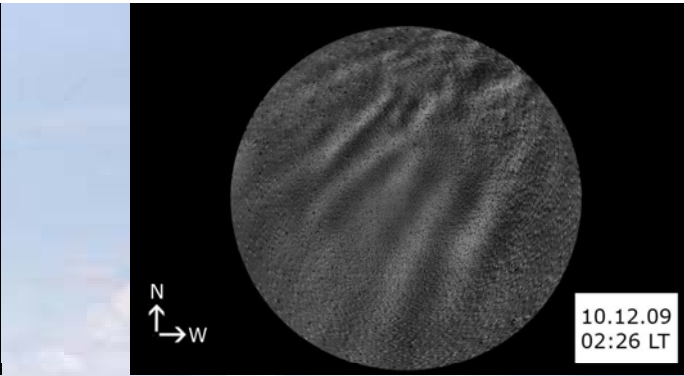
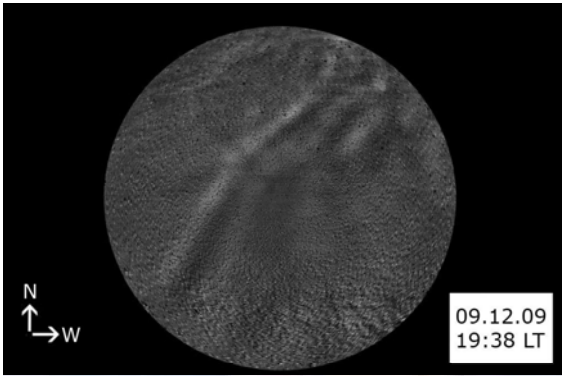


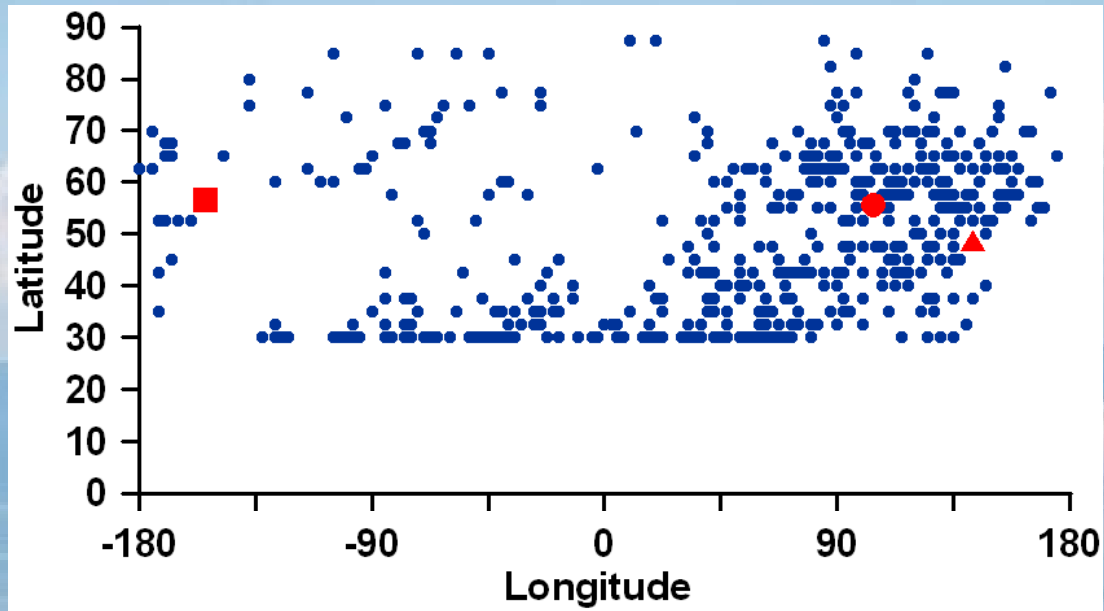
The responses of subpolar and mid-latitude ionosphere on the series of stratosphere warming events in 2008, 2009 and 2010 were investigated on the base of ionosondes located near Irkutsk (52.5N, 104E), Yakutsk (62N, 129.6E), Noril'sk (69.2N, 88.26E), Irkutsk IS radar (52.9N, 103E), ISTP optic facility (52N, 103E) and oblique-incidence sounding using chirp sounder.



Optics facilities

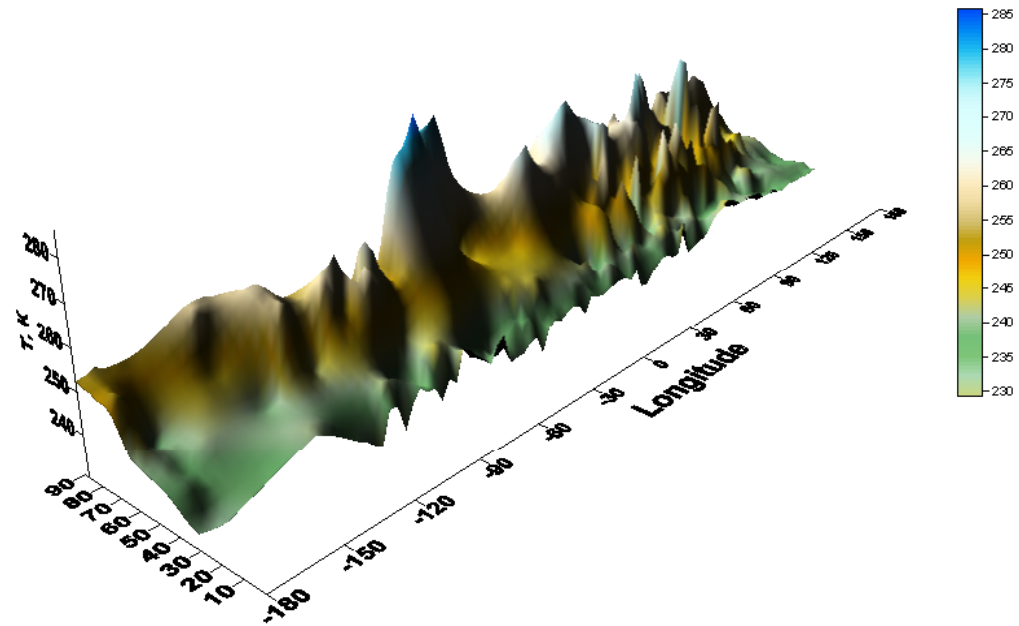




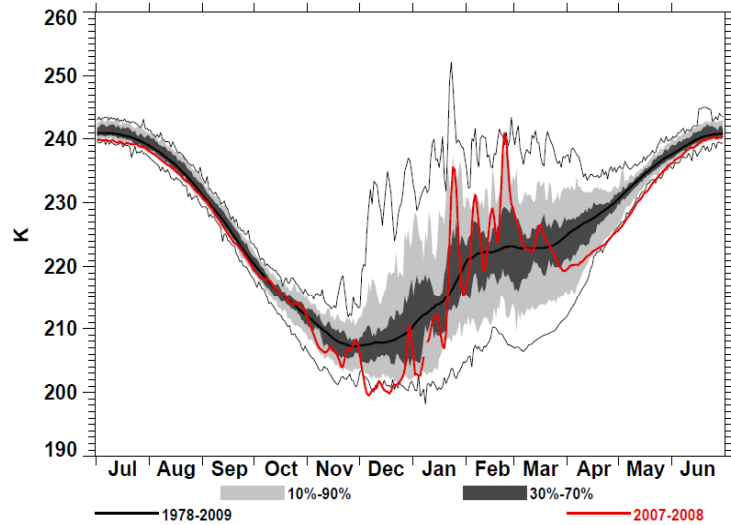


- *Irkutsk (52°N, 104°E)*
- ▲ *Hokkaido (43,5°N, 143,6°E)*
- *King Salmon (57°N, 157°W)*

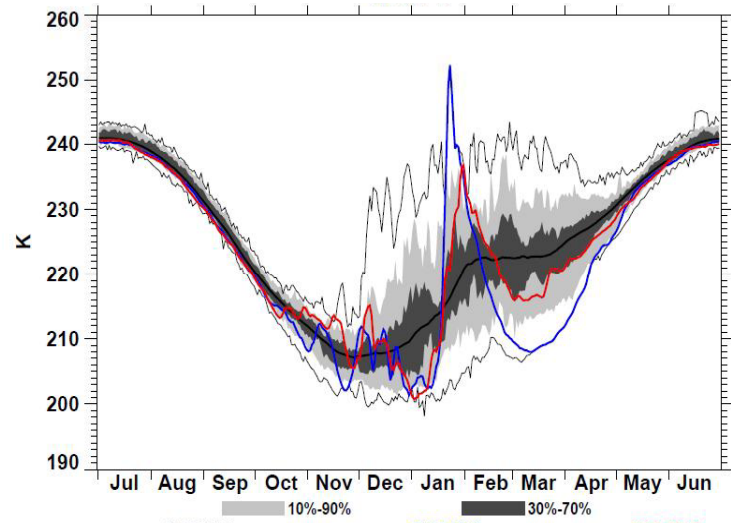
2005-2010



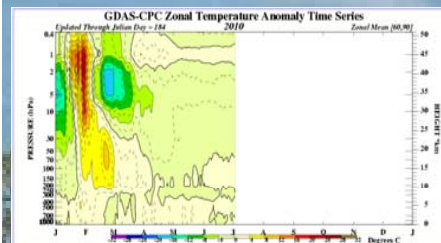
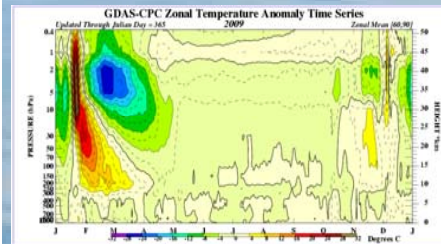
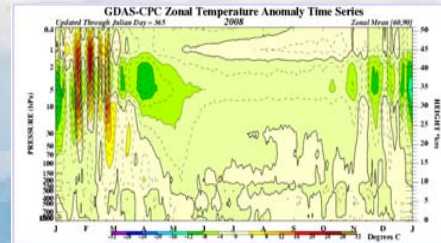
60-90°N Zonal Mean Temperature 10 hPa



P. Newman (NASA), E. Nash (SSAI), C. Long (NOAA)



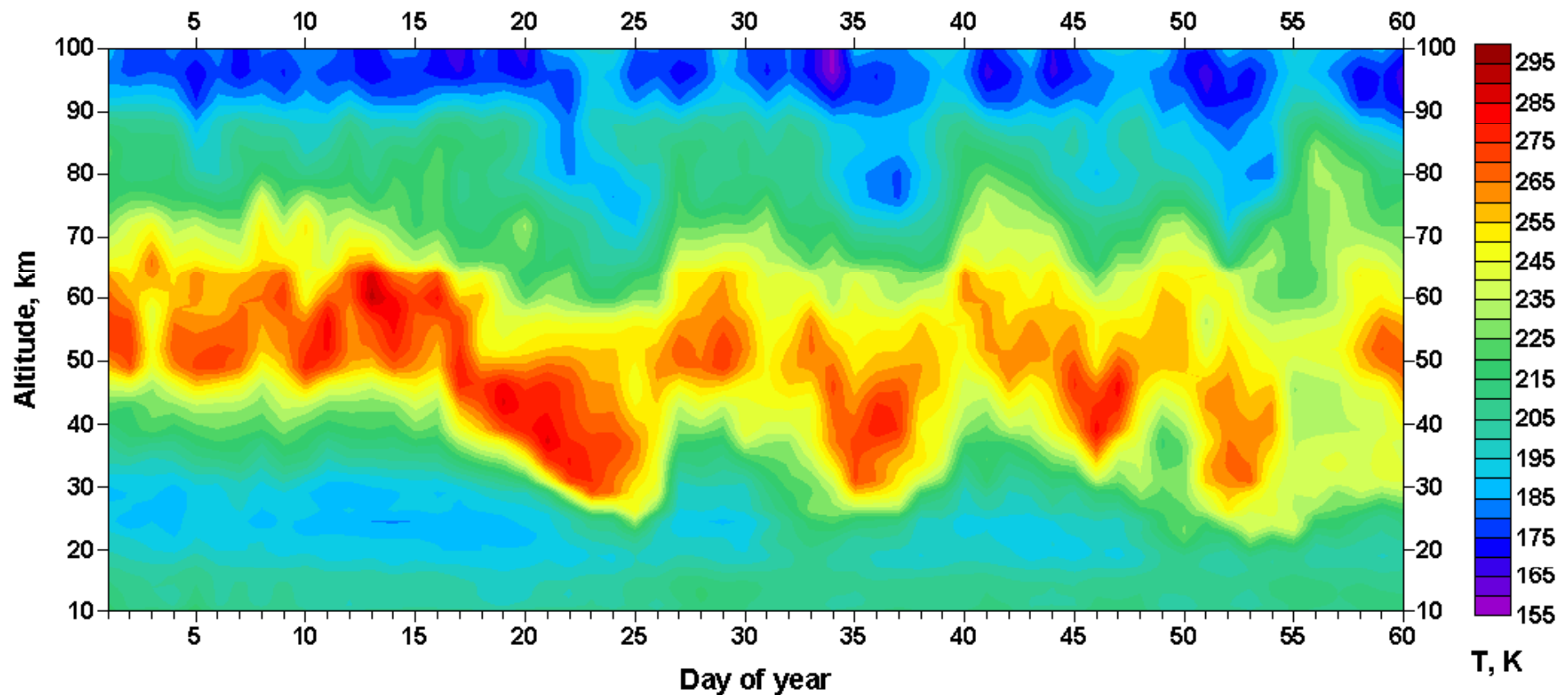
P. Newman (NASA), E. Nash (SSAI), C. Long (NOAA)



http://code916.gsfc.nasa.gov/Data_services/met/ann_data.html

Noril'sk January-February, 2008.

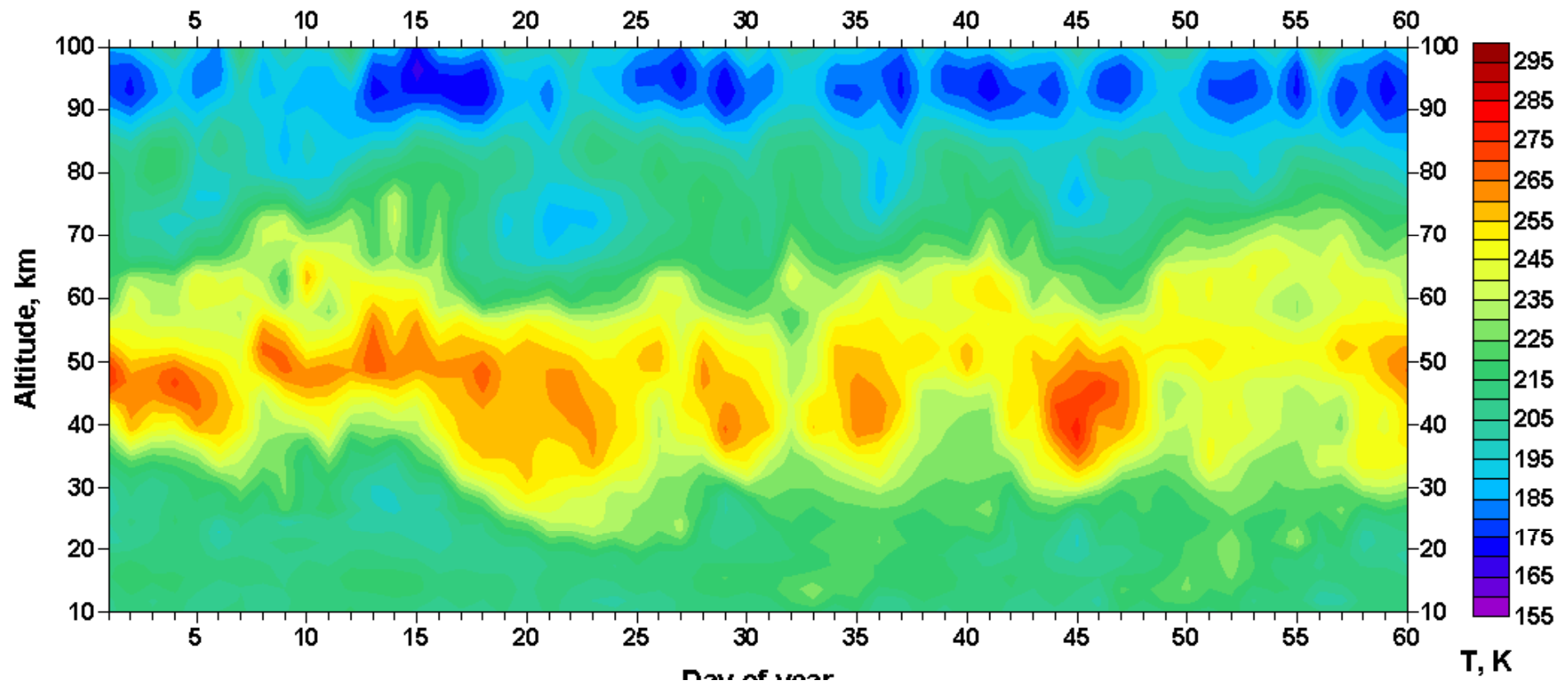
<http://disc.sci.gsfc.nasa.gov/Aura/MLS/index.shtml>



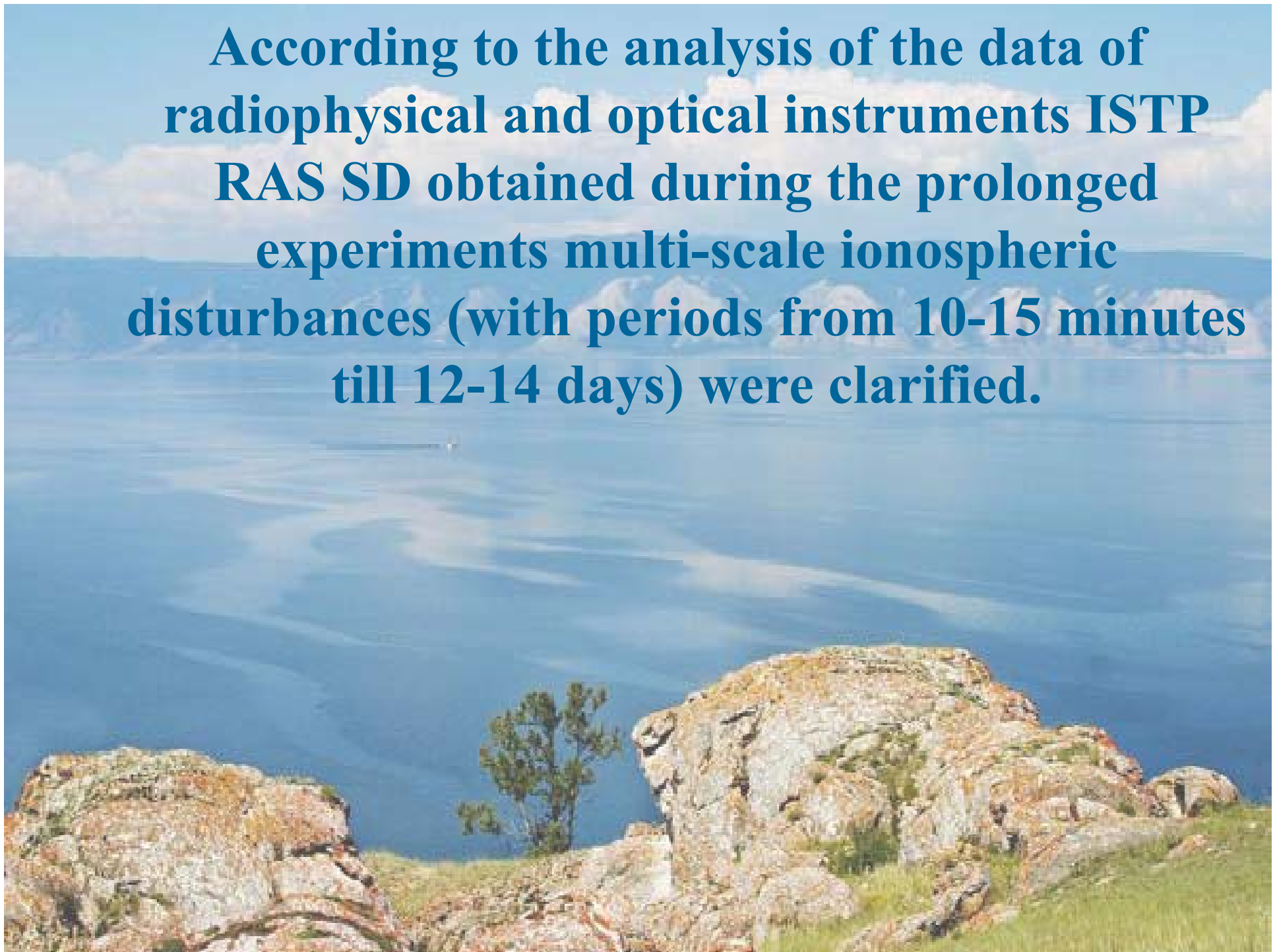
Irkutsk

January-February, 2008.

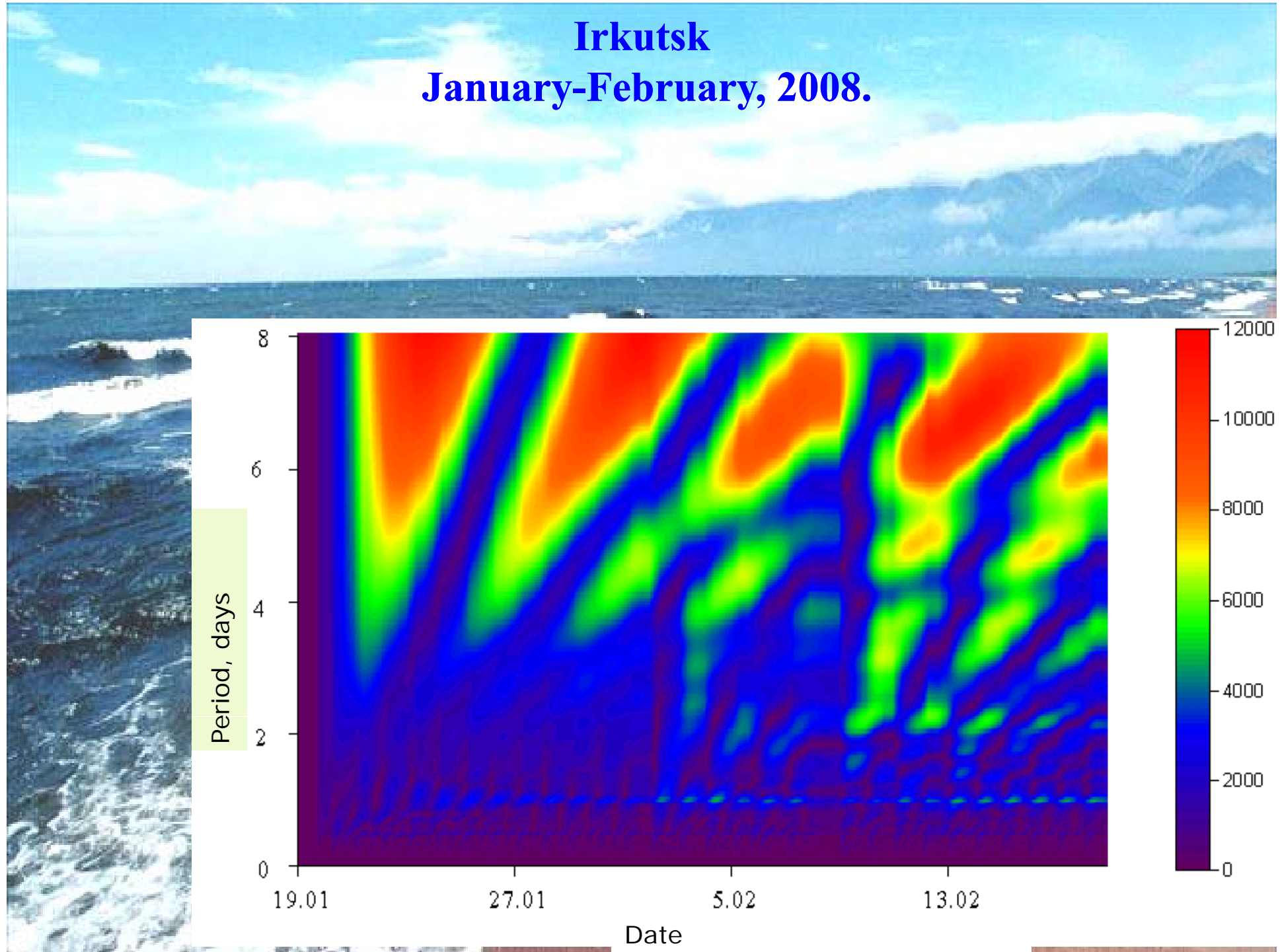
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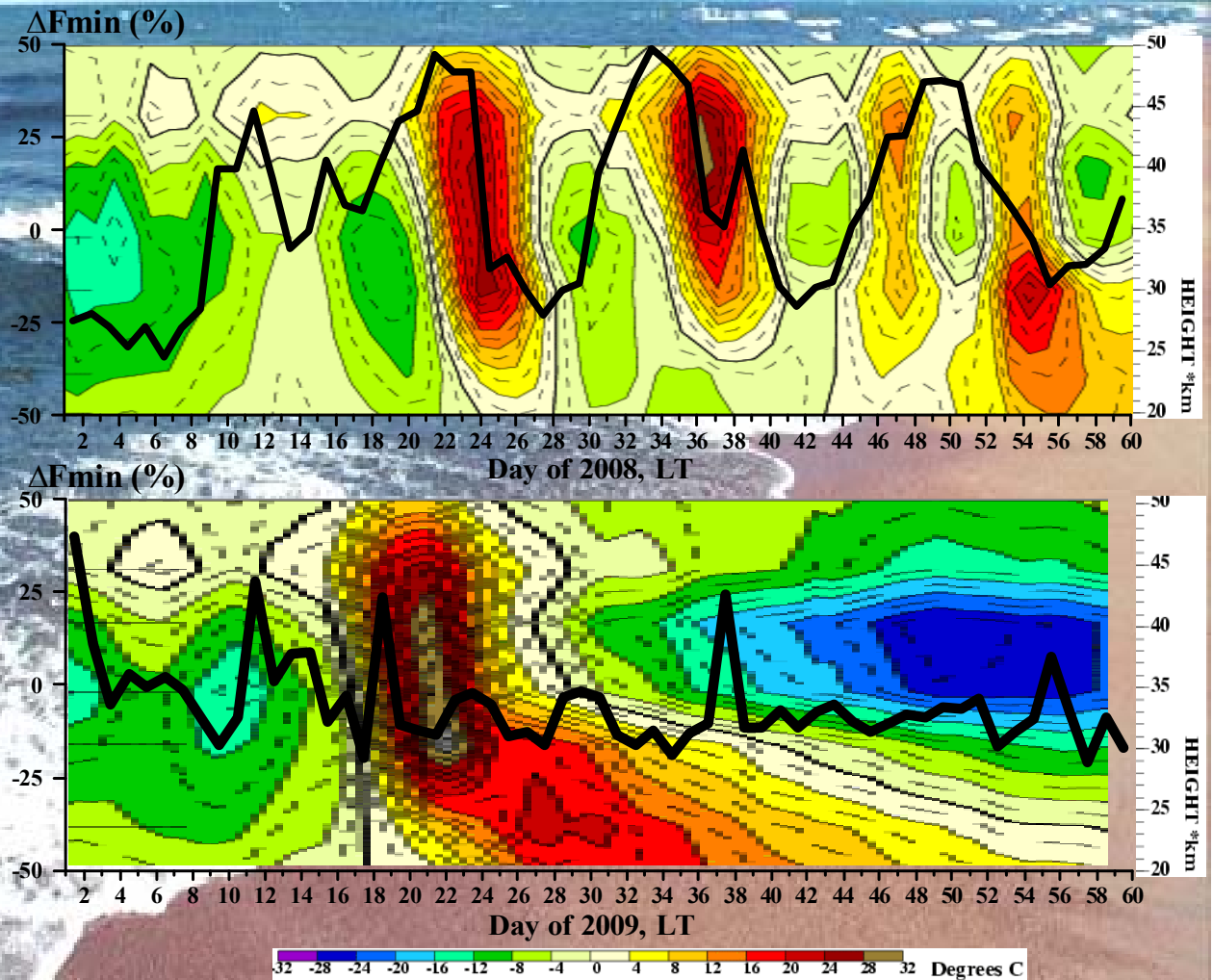
According to the analysis of the data of radiophysical and optical instruments ISTP RAS SD obtained during the prolonged experiments multi-scale ionospheric disturbances (with periods from 10-15 minutes till 12-14 days) were clarified.



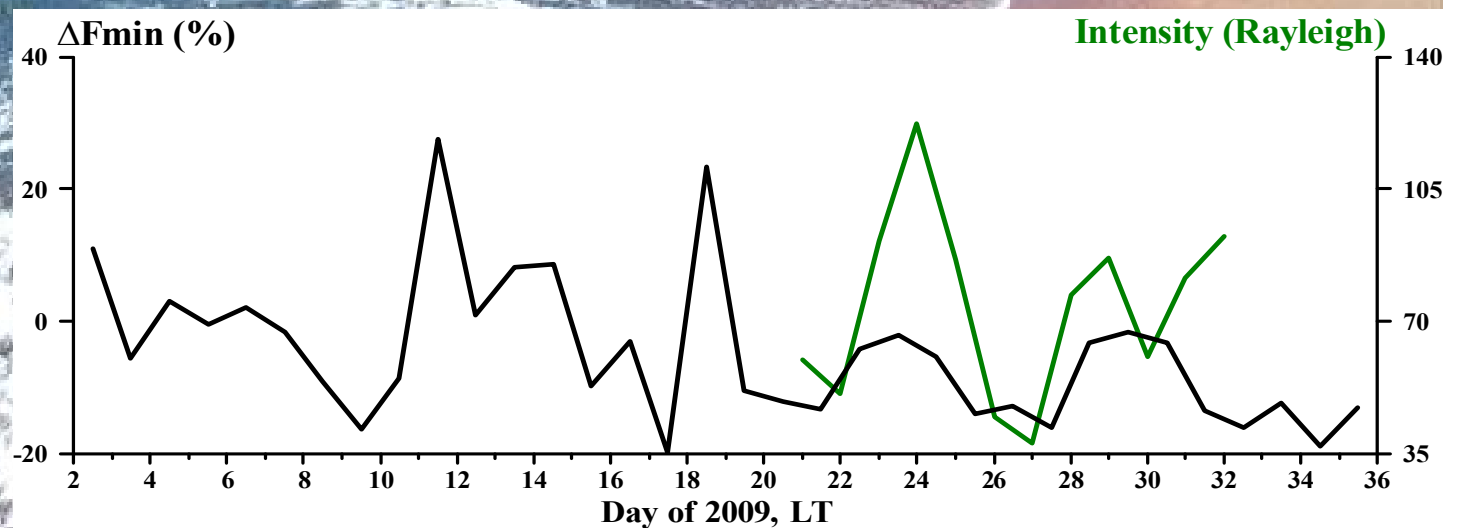
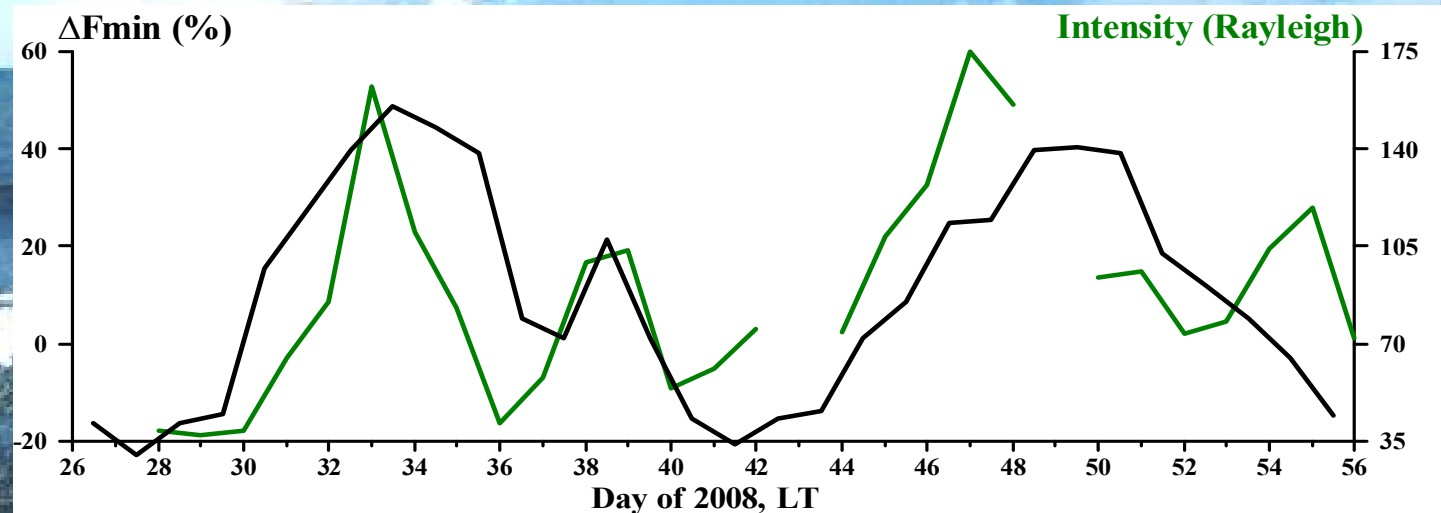
Irkutsk January-February, 2008.



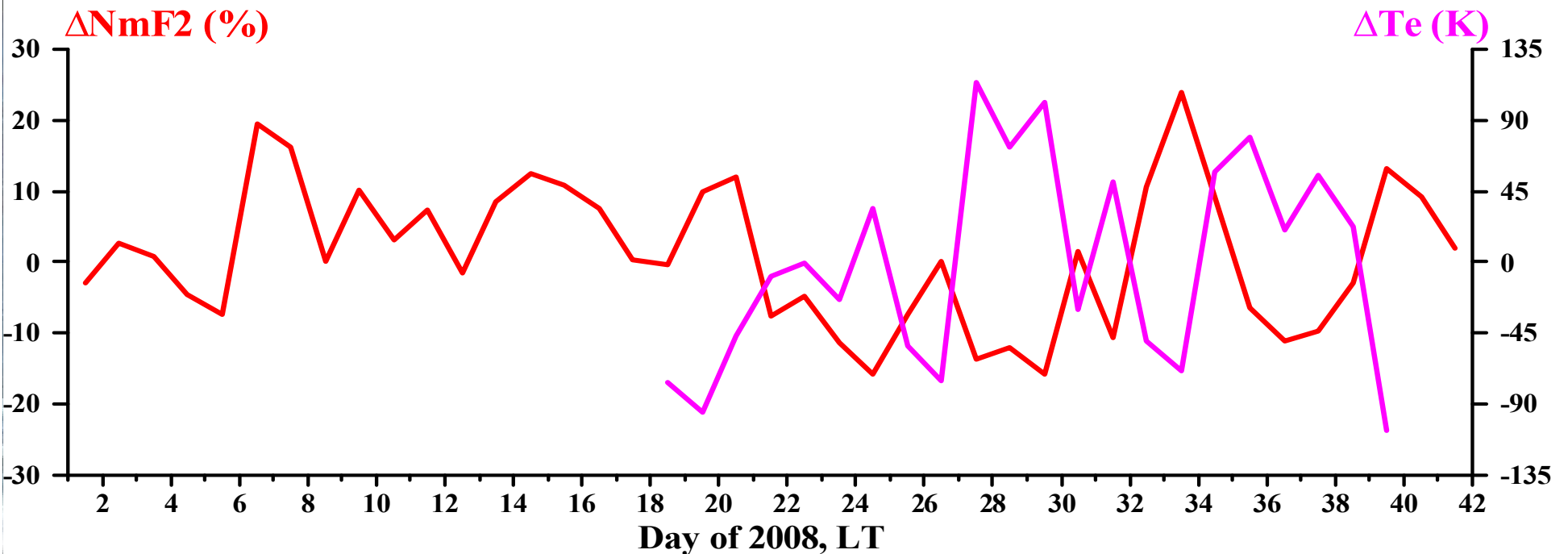
Day-to-day variations of the disturbances of ΔF_{min} (% - black line) and Zonal Temperature Anomaly. In 2008 one can see strong wavelike variations of ΔF_{min} , whereas in 2009 it is seen pulse-like disturbances. The amplitude of ΔF_{min} variation is noticeably greater in 2008 compared to 2009.
<http://www.cpc.ncep.noaa.gov/products/stratosphere/>

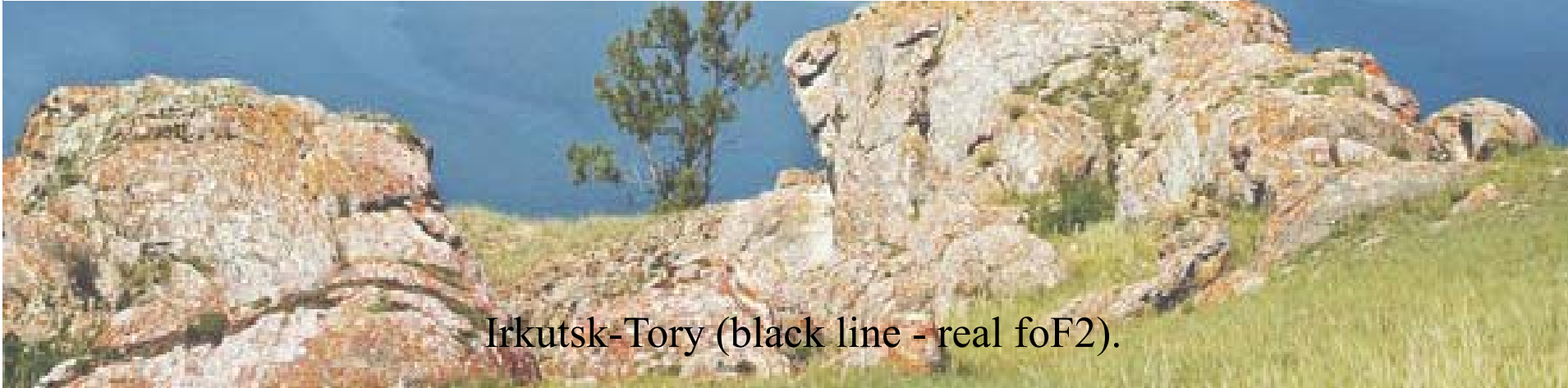
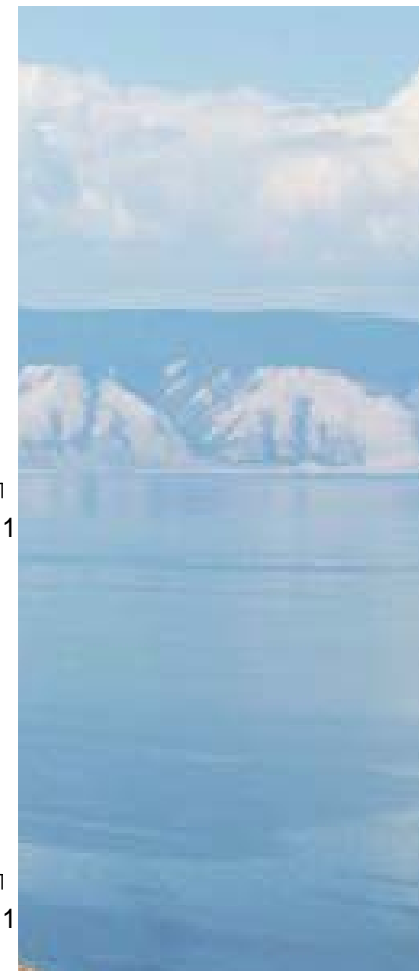
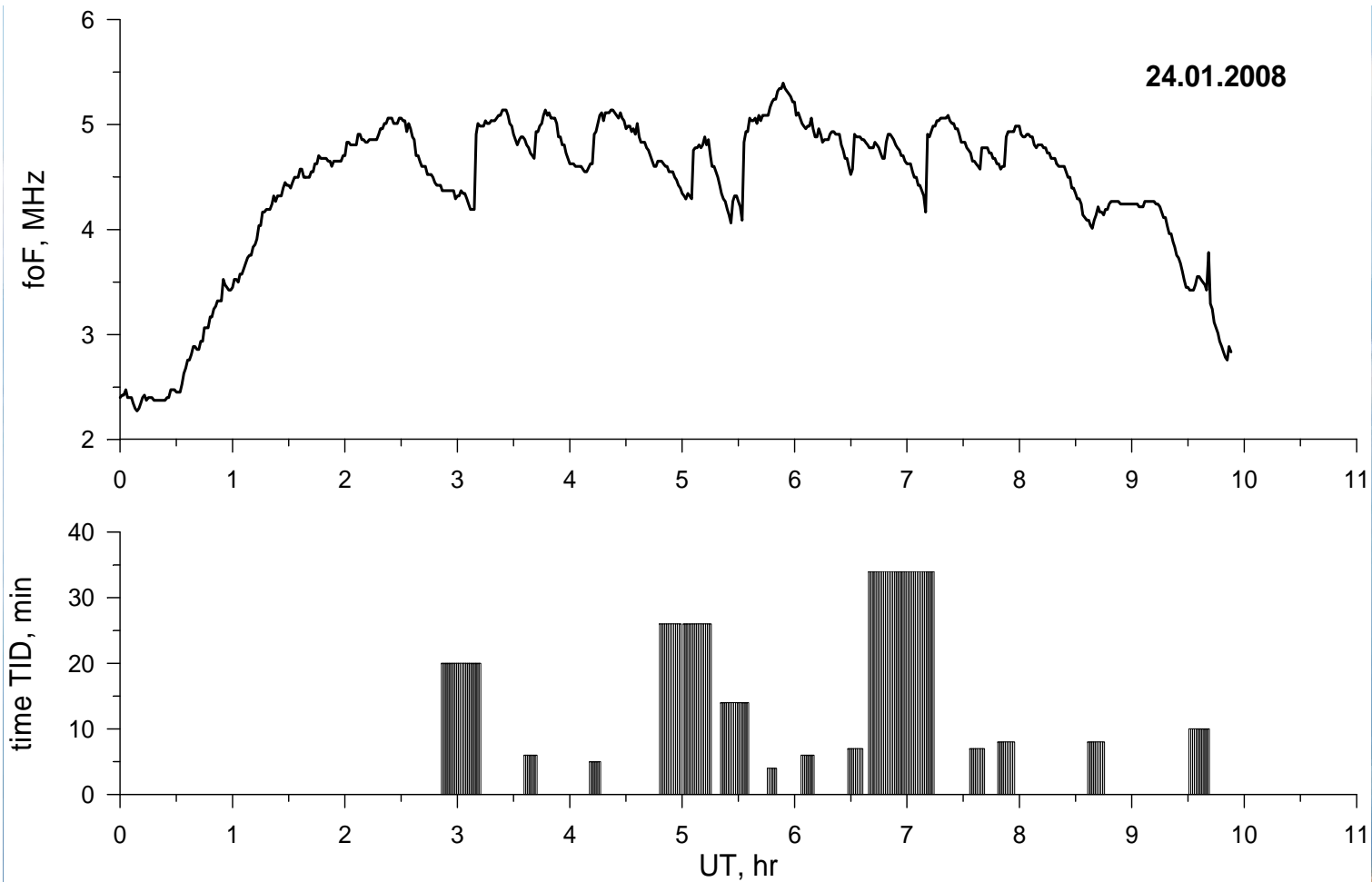


Day-to-day variations of ΔF_{min} and the nighttime average 557.7 nm upper atmosphere airglow intensity for 2008 and 2009. The airglow intensifications correlate with the ΔF_{min} positive phases, i.e. with the HF absorption enhancement in contrast to 2009 .



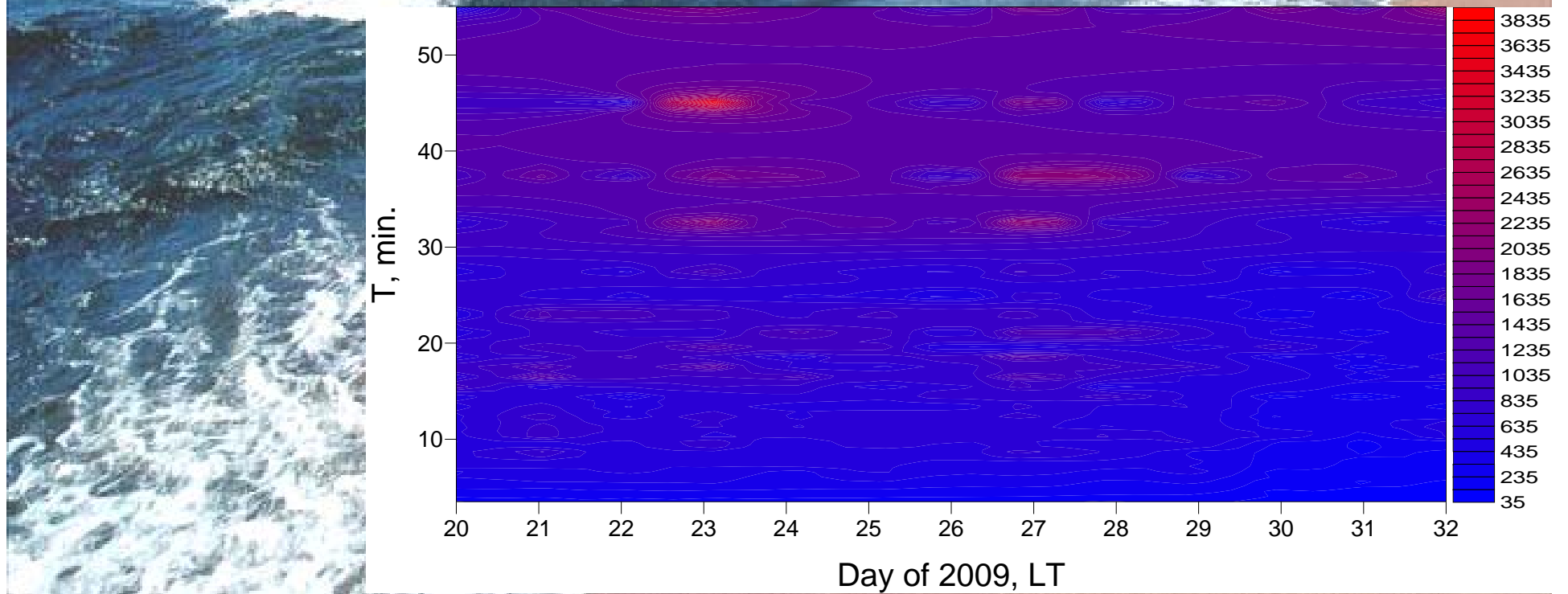
Day-to-day variations of the disturbances of peak electron density ($\Delta N_m F_2$) and electron temperature at 260 km (ΔT_e). It is seen well pronounced anti-correlation between $\Delta N_m F_2$ and ΔT_e .



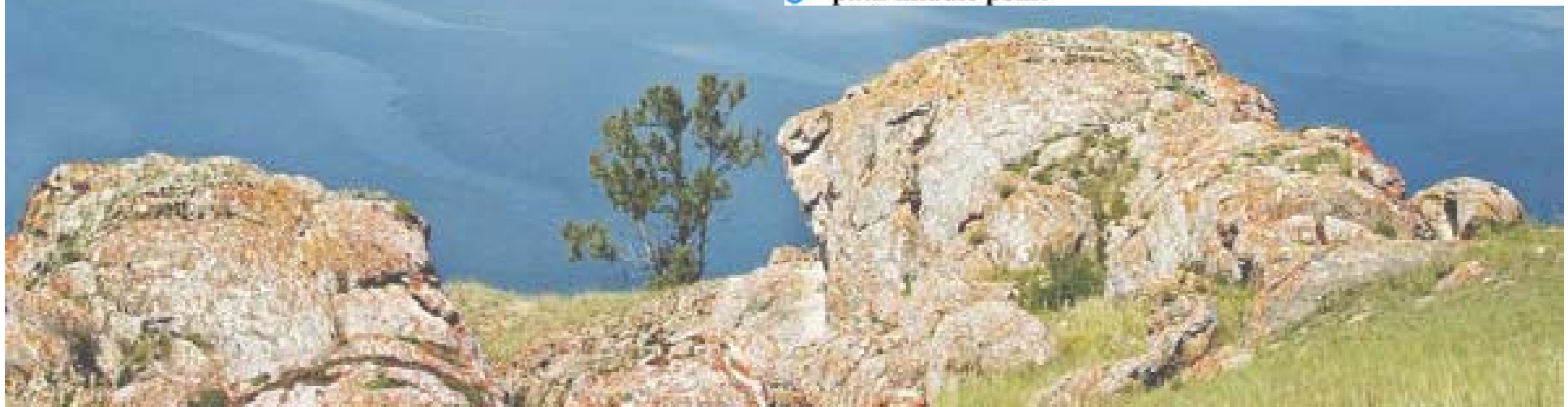
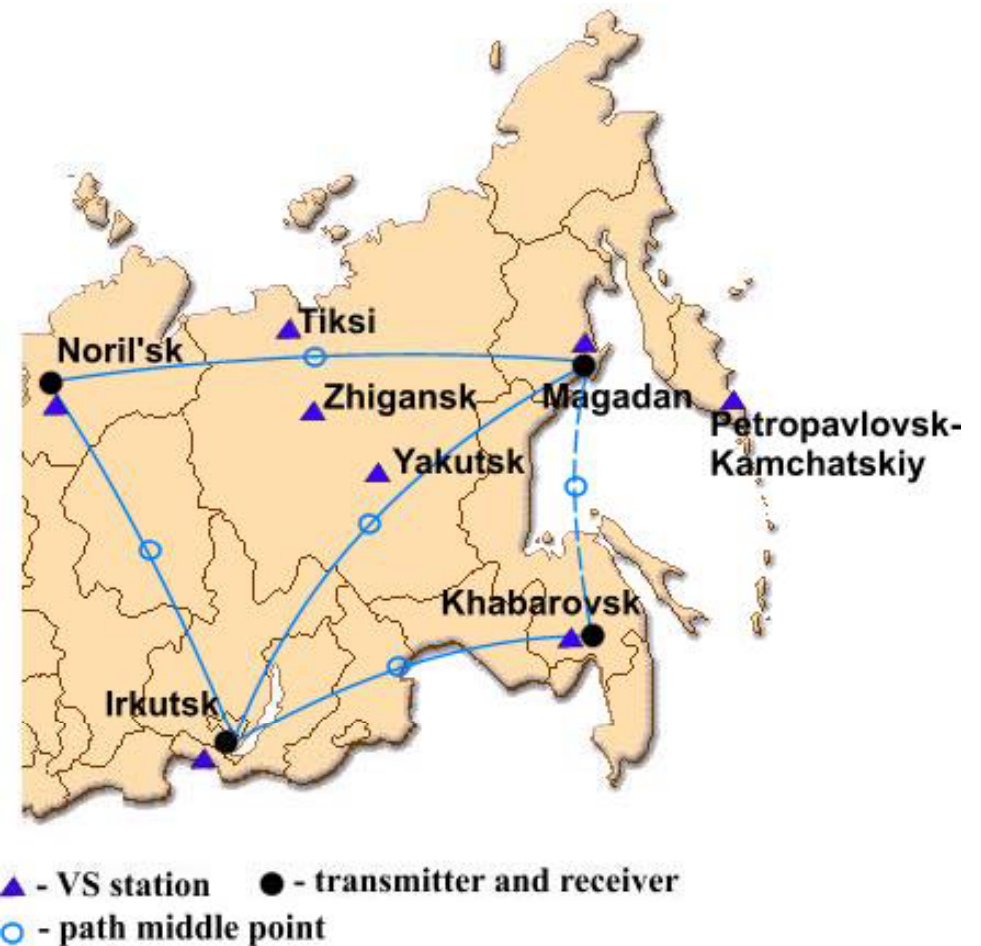


Irkutsk-Tory (black line - real foF2).

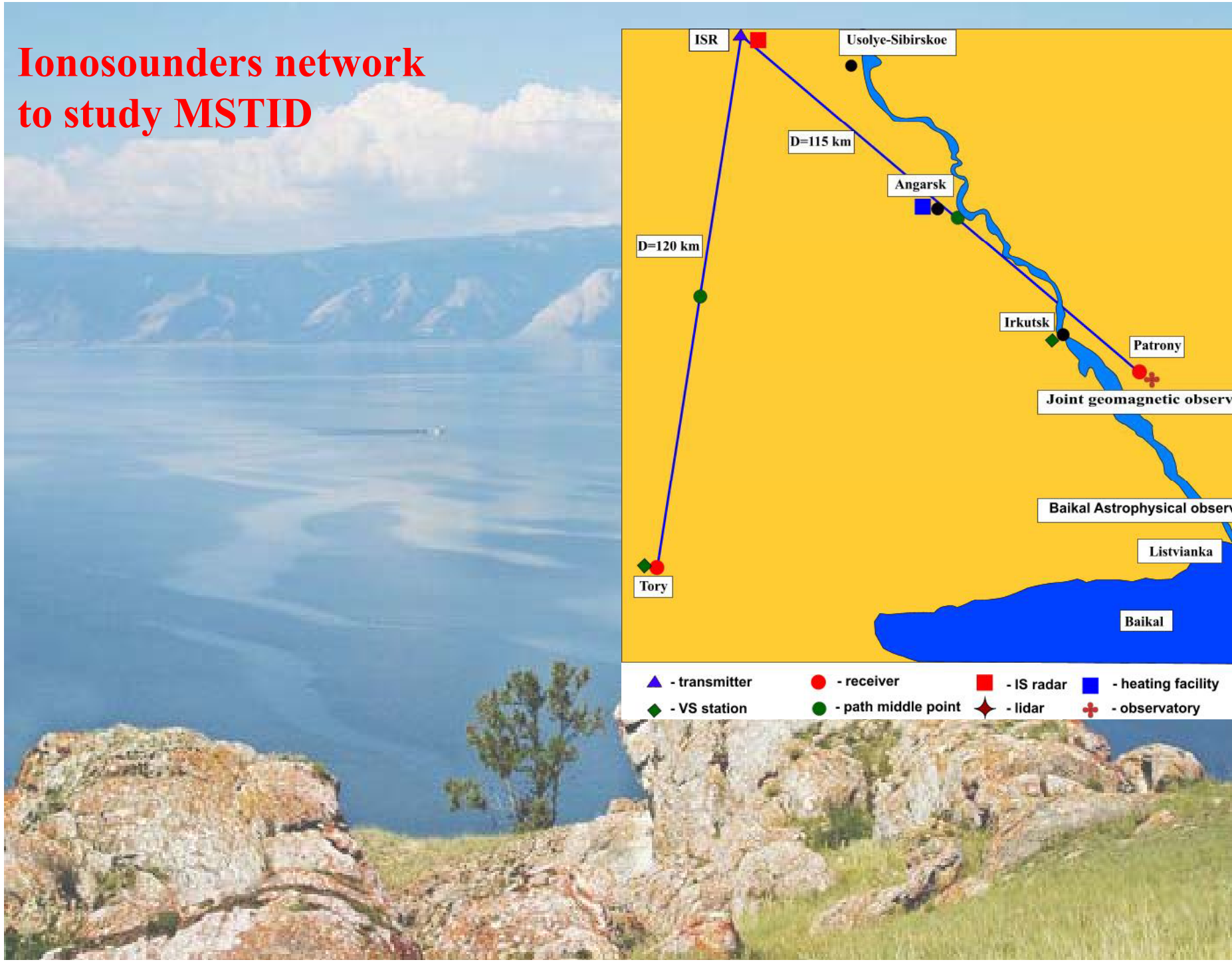
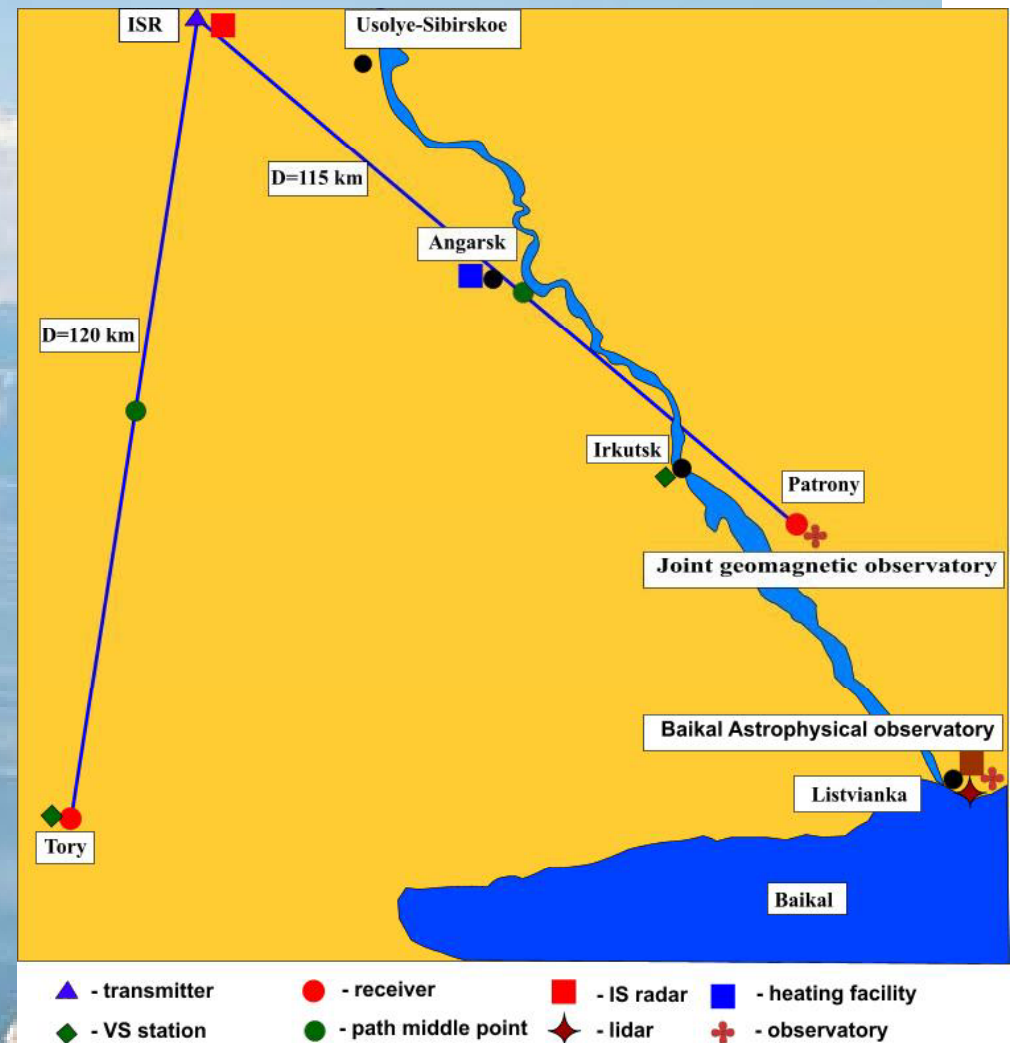
Spectrum of variations of the nighttime 557.7 nm atmosphere airglow intensity for 2009.

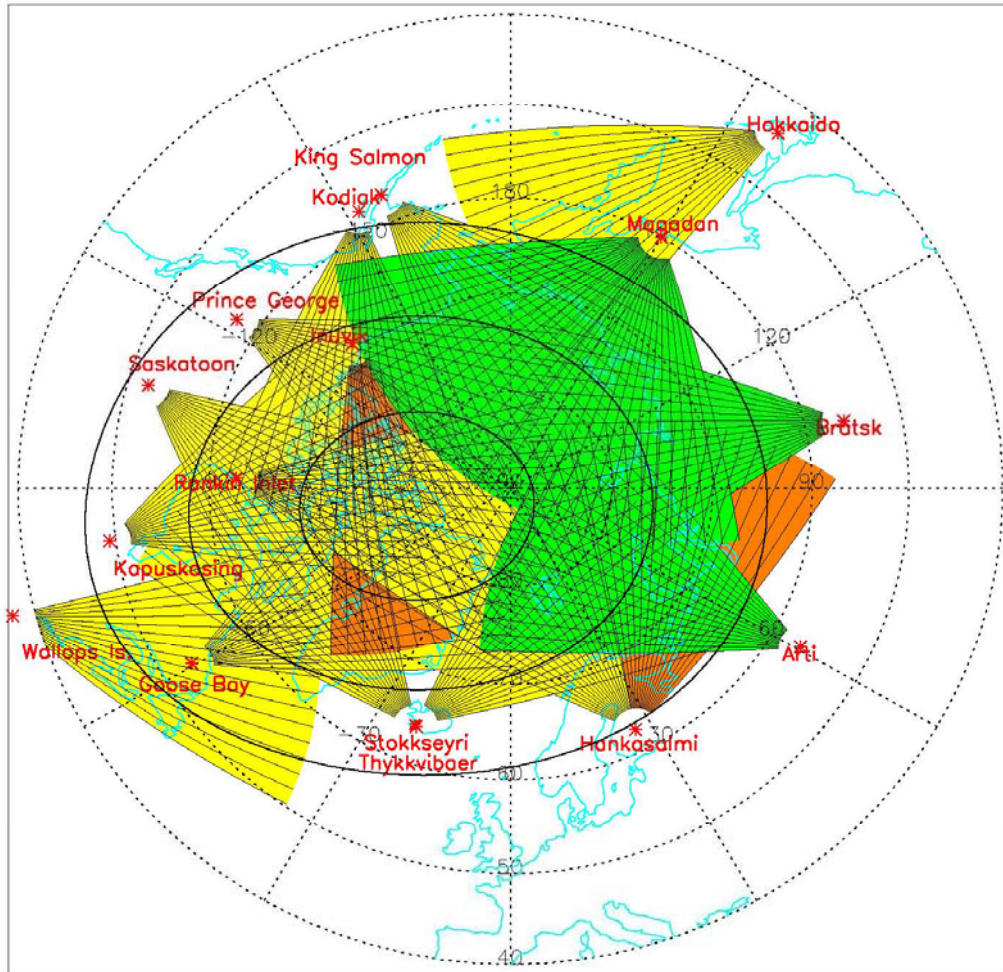


Modernized complex of digital ionosounders to research the ionosphere over extensive Russia region from subpolar to middle latitudes into longitudinal sector 90-150°E.



Ionosounders network to study MSTID





**THANK YOU FOR
ATTENTION!**

