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HOFBURG PALACE
VIENNA, AUSTRIA

SCIENCE AND TECHNOLOGY 2017

Some results of recording infrasound and internal gravity waves from atmospheric storms

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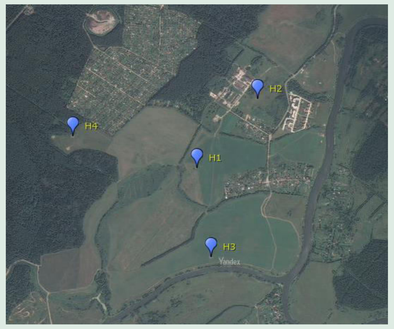
INTRODUCTION

➢The infrasound data from atmospheric storms obtained at the I43RU station were analyzed. The corresponding data of infrasound and internal gravity waves at the group of microbarographs in the Moscow regions were analyzed.

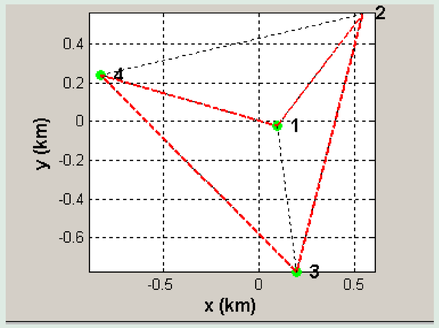
➢ Infrasound at a frequency of about 0.3 Hz from convective storms during August 12, 2016 was observed. The corresponding results of recording internal gravity waves from atmospheric storms are presented.

➢Fluctuations of atmospheric pressure were detected during the approach of an atmospheric storm towards the recording network, and then its moving away. The regularity of changes in the parameters of internal gravity waves (coherence, azimuth arrival, amplitude and horizontal velocity of propagation waves) is obtained.

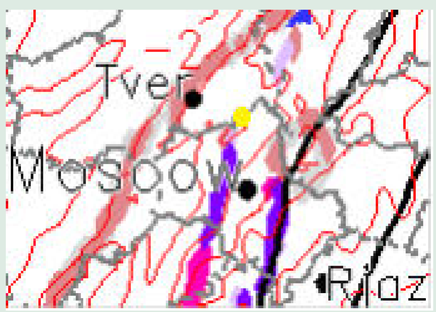
INFRASOUND STATION I43RU, DUBNA



Satellite map
Location of sensors H1-H4
(I43RU Dubna)

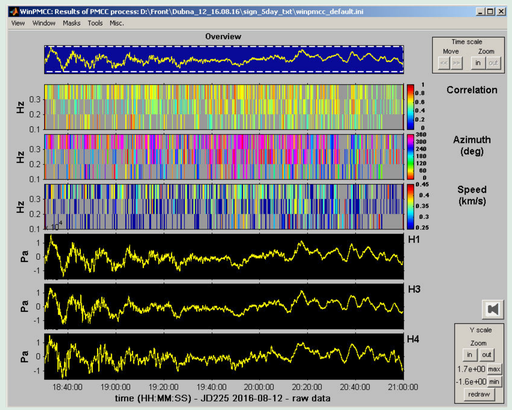


Location pattern of
sensors H1-H4 in WinPMCC

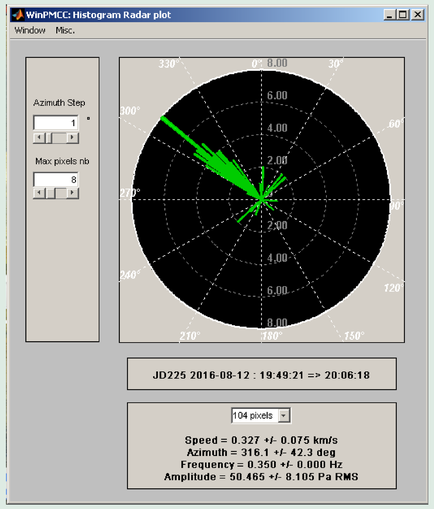


Atmospheric storms during August 12, 2016 from 18:30 to 21:00 UT.
Yellow circle is location of I43RU Dubna.
The distance between Moscow-Dubna is 109 km.

INFRASOUND FROM ATMOSPHERIC STORMS

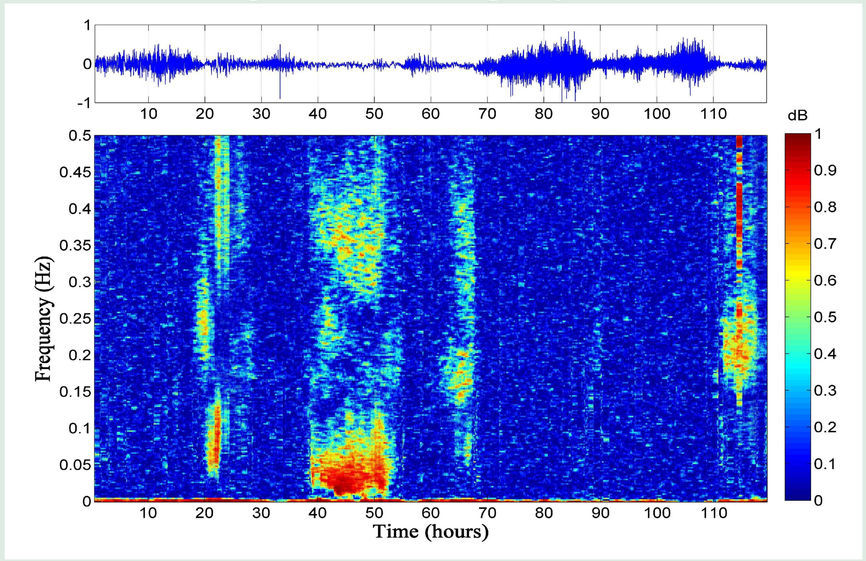


WinPMCC analysis of the infrasound signal from atmospheric storms for the August 12, 2016 from 18:50 to 20:06 UT at I43RU.

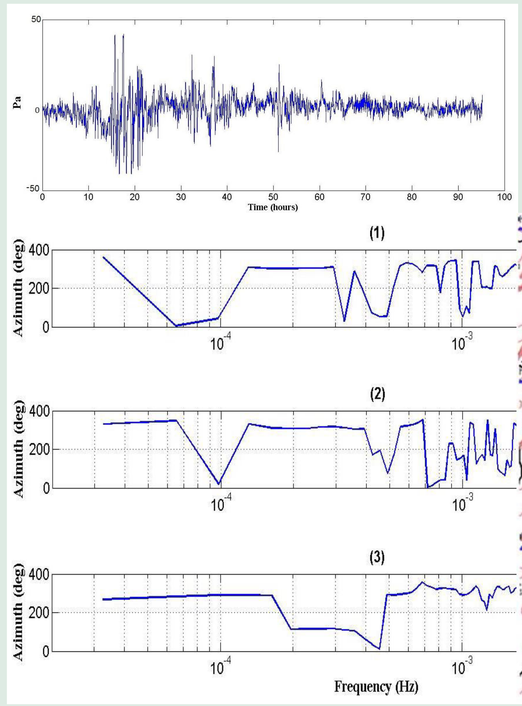


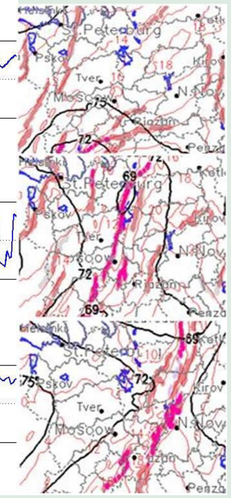
Azimuth arrival of infrasound at a frequency of about 0.3 Hz from atmospheric storms is 316 deg in good agreement with the direction of the atmospheric storm.

Coherent infrasonic signal in the time-frequency domain recorded at I43RU



INTERNAL GRAVITY WAVES FROM ATMOSPHERIC STORMS





Top left: Results of recording internal gravity waves generated by atmospheric storms for the June 26-30, 2015 at the group of microbarographs in the Moscow regions.
Right: Weather maps.
Left: Azimuth arrivals of internal gravity waves during the approach of atmospheric storm towards the recording network (1), during the passage of the storm (2) and then its moving away (3).

REFERENCE

S.N. Kulichkov, N.D. Tsybulskaya, I.P. Chunchuzov, E.V. Golikova et al. The Study of the Internal Gravity Waves from Atmospheric Fronts in Moscow Region. Izvestiya, Atmospheric and Oceanic Physics. -2017,-V.53.- №4.-P. 1-15.

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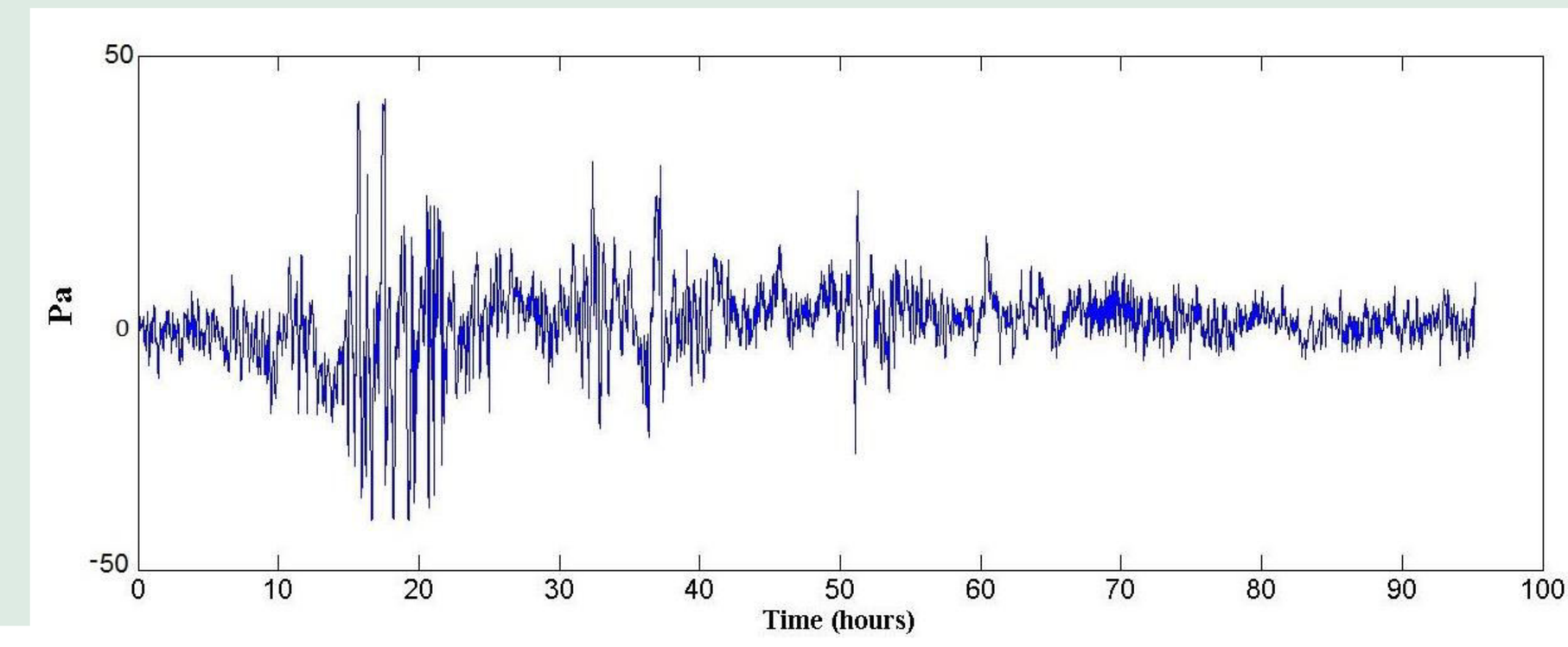
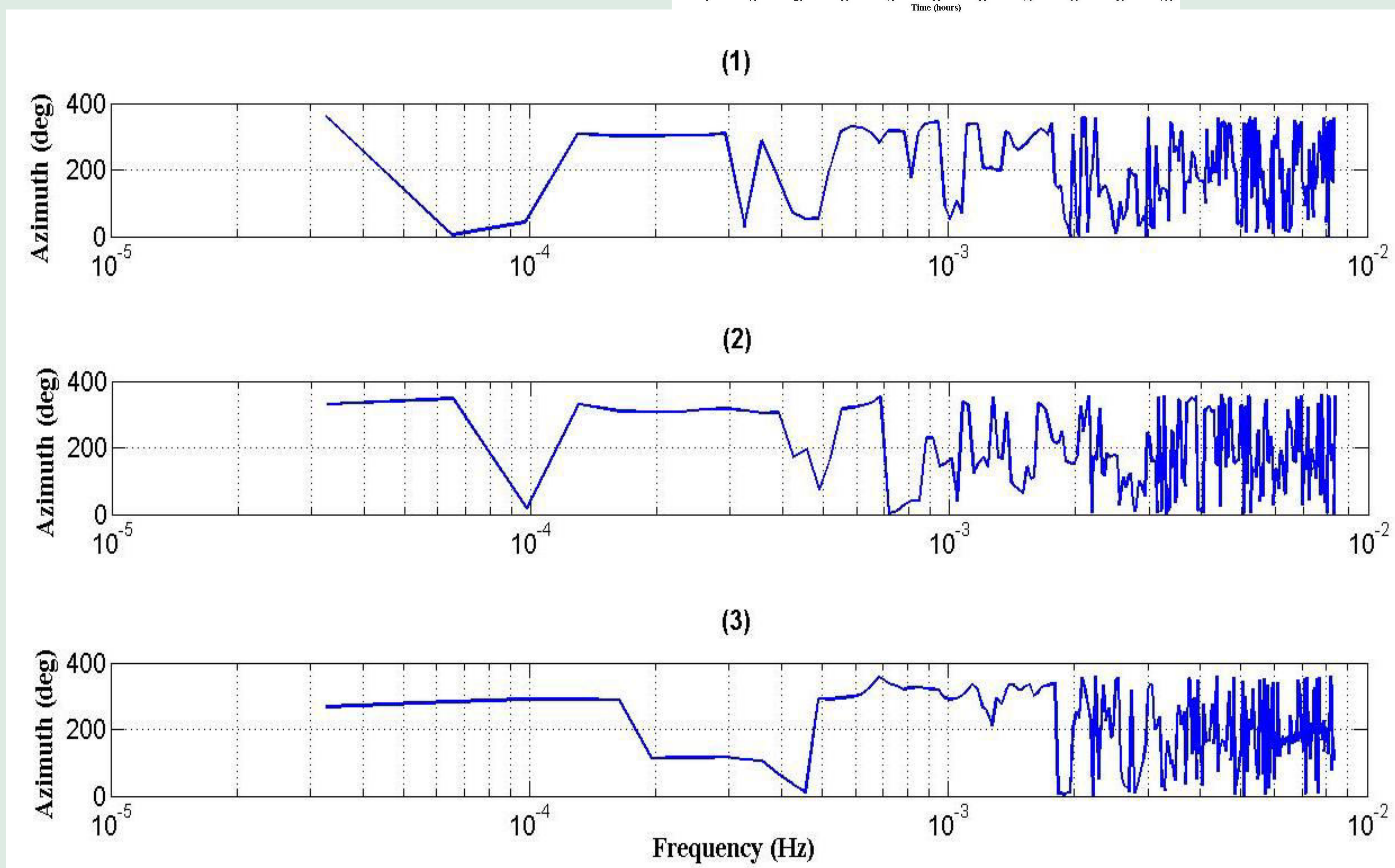
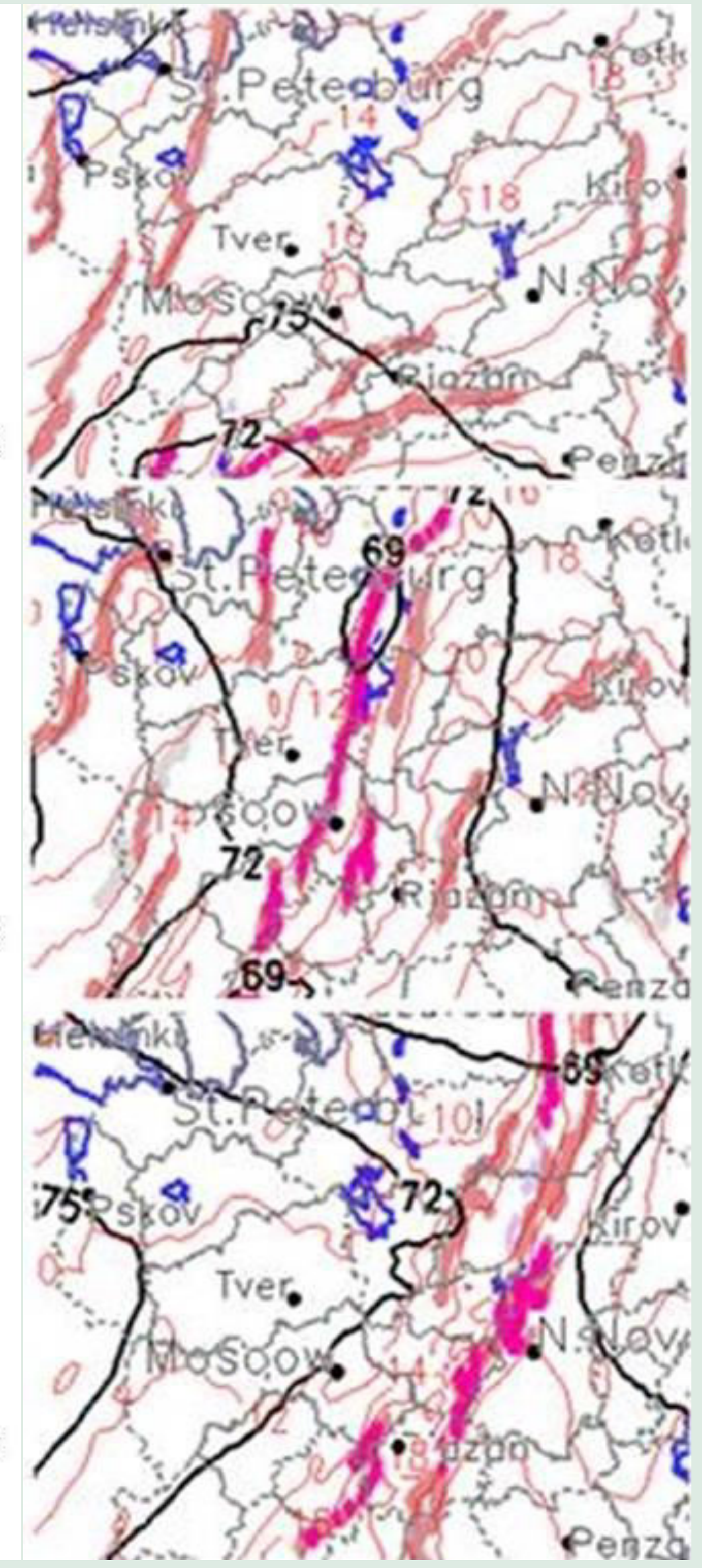

Pa
Time (hours)


(1)
(2)
(3)
Azimuth (deg)
Frequency (Hz)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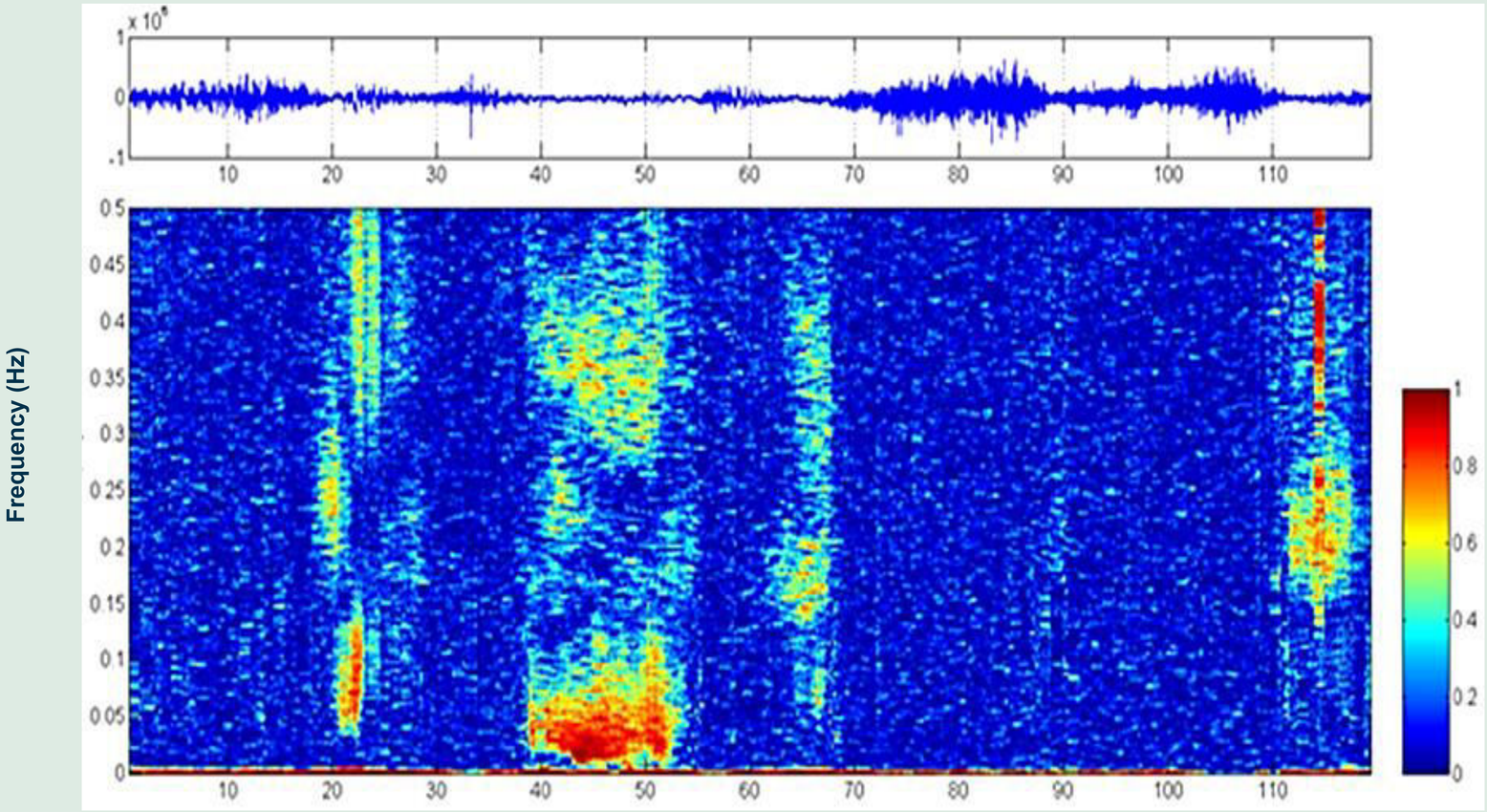
Pskov
Tver
Moscow
N.Nov
Kirov
Riazan
Penza
Helsinki
75
72
69


x 10^8
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30
40
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60
70
80
90
100
110
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0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
1
0.8
0.6
0.4
0.2
0
Frequency (Hz)
Time (hours)