Exploration Capabilities of Helicopter-Borne Time-Domain EM System EQUATOR

Geotechnologies, booth#444

The year 2010 EQUATOR chronics:

February - Tver,
test flights

March - PDAC 2010,
presentation

July - Estern Sayan,
1200 km

September - Estern Sayan,
1500 km

October - Arkhangelsk,
2000 km

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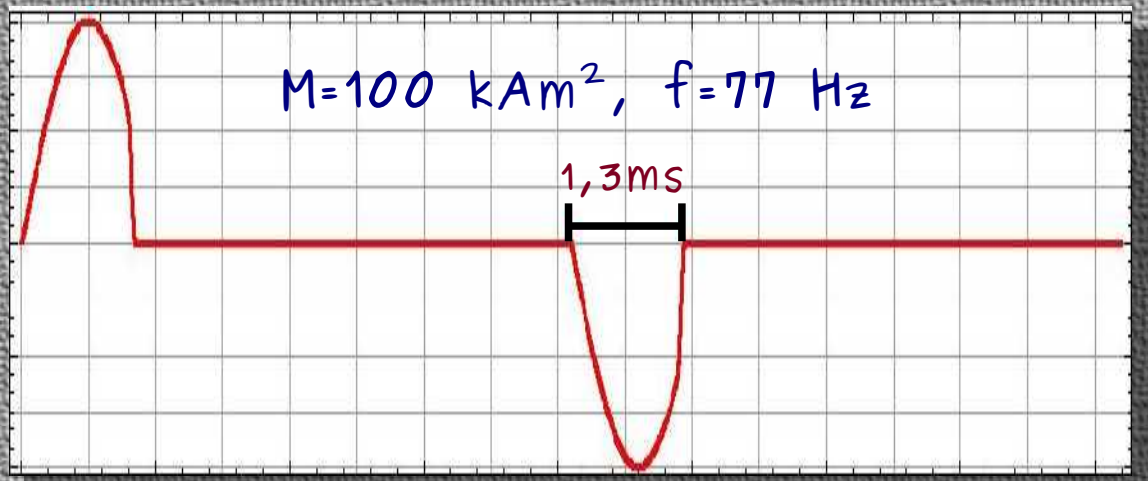
EQUATOR design features

Transmitter (Tz)



Receiver (Rx,Ry,Rz)

Full time

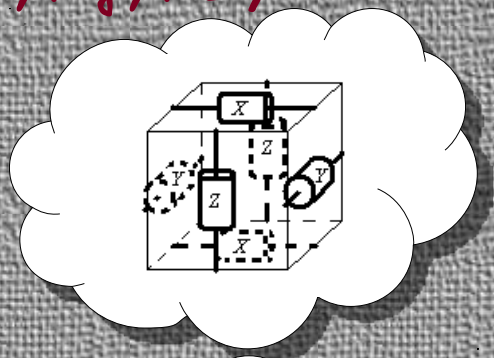
ADC 200 kHz

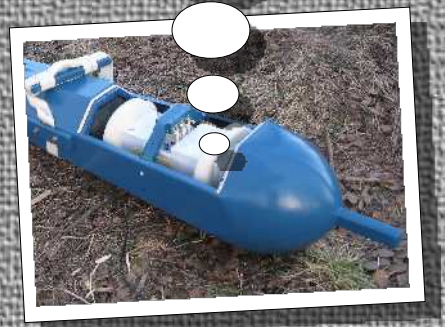
B & dB/dt

7 Hz output

Time channels:

5 µs, 10 µs, ...





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EQUATOR additional equipment

Differential mode is available

Mag

GPS

EM

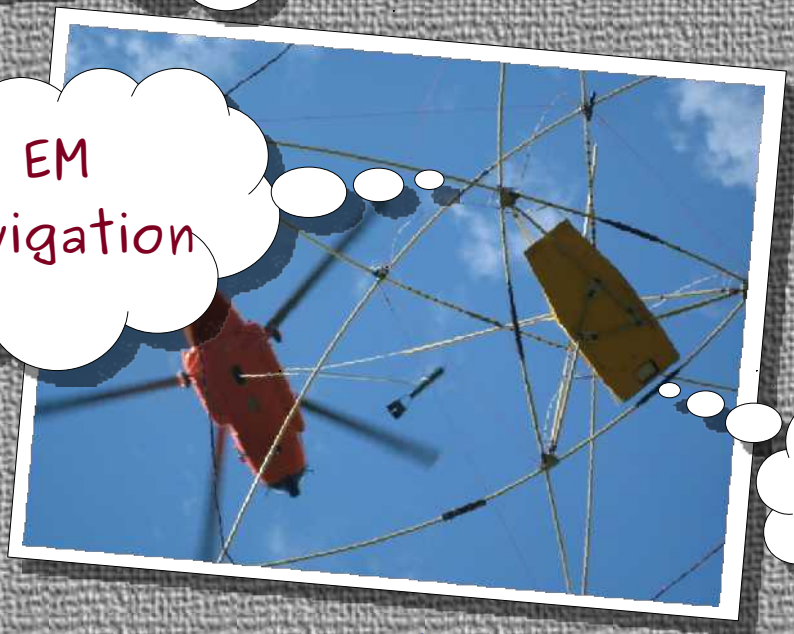
Magnetic field measurements by GT-MAG: 1000 Hz

25 Hz output after adaptive filtering

EM Relative Navigation System precision

Distance: 10 cm

Attitude: 1°



EM navigation

RA

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EQUATOR technical characteristics

One point attachment

stabilizers

Weight: 250 kg

Power: 27 V 100 A

Velocity: 170 km/h

No piloting limitations!

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EQUATOR in Eastern Sayan mountains

July: 1200km

September: 1500km

Scale: 1:25000

In cooperation with NF VSEGEI

Mi-8 MTV

Base Altitude 1800m

Routes length 10km

$\Delta h \sim 1km$

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EQUATOR crush test

Landing at 10am

Take off at 3pm

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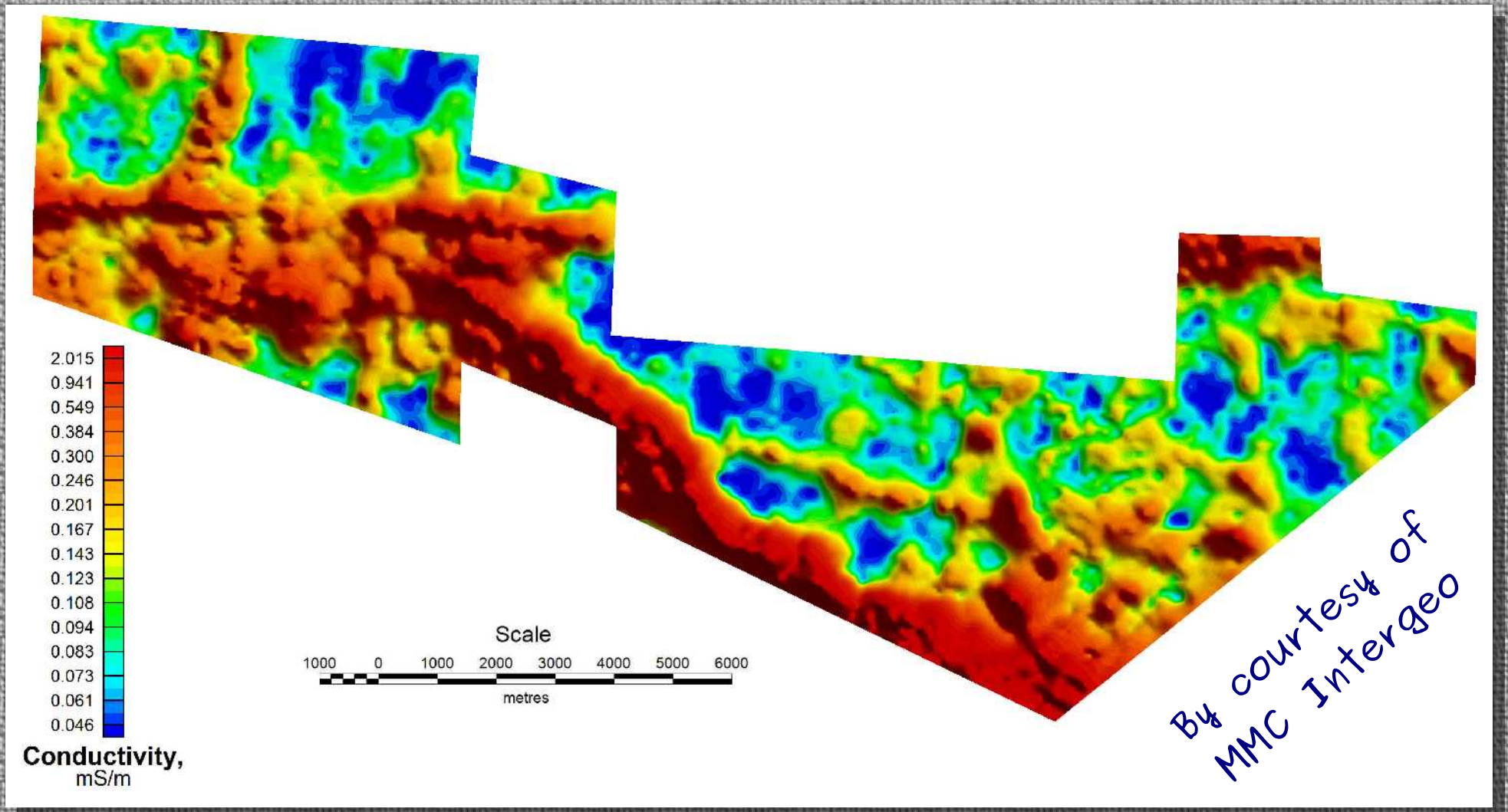
EQUATOR survey results: Eastern Sayan



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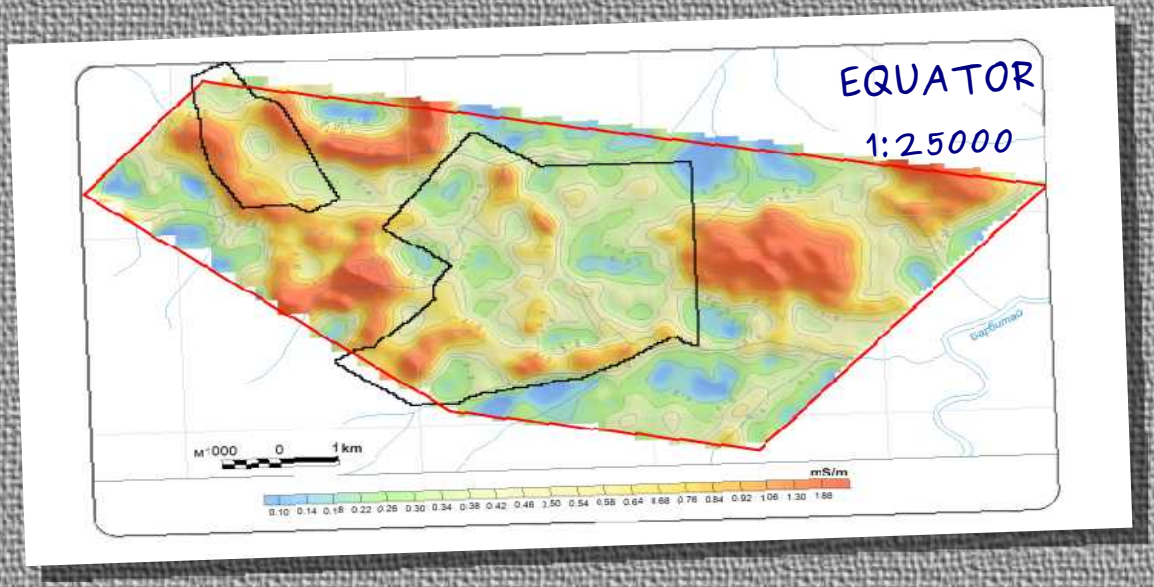
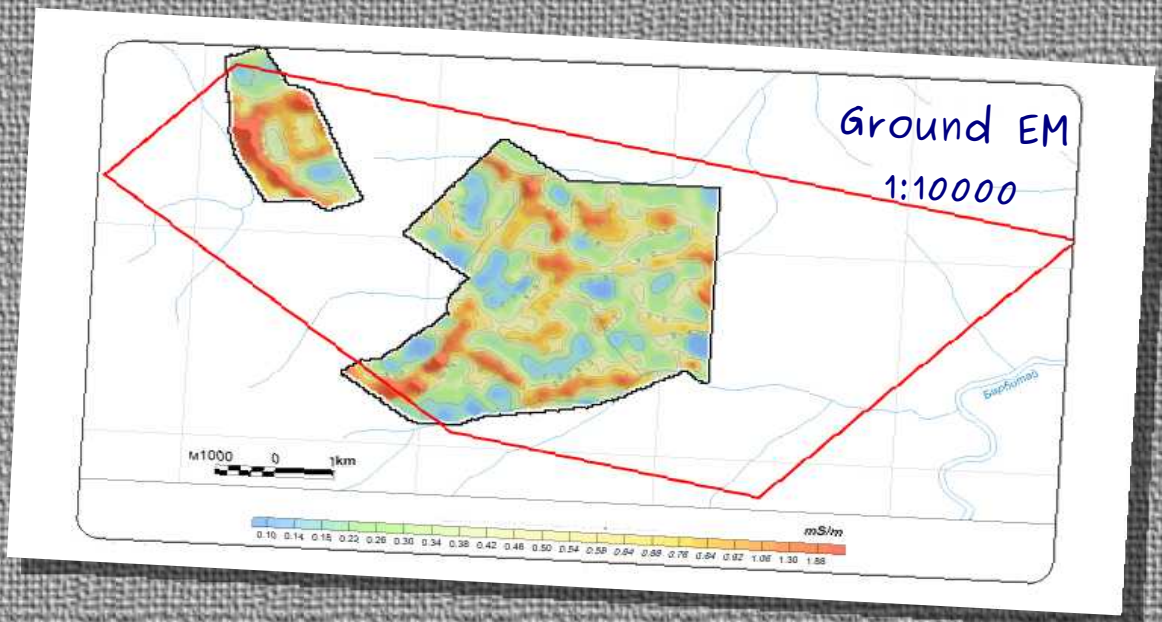
EQUATOR survey results: Eastern Sayan





Thanks to NF VSEGEI
(Norilsk Branch of VSEGEI)

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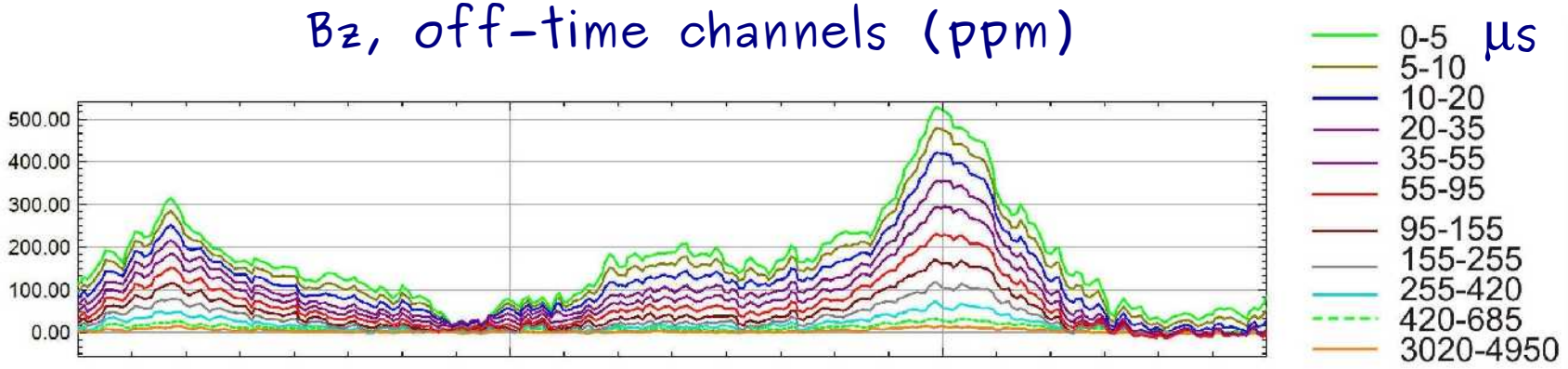
EQUATOR survey results: Eastern Sayan



Ergoju ore deposit belongs to the skarn type of gold-silver-lead-zinc mineralization

http://grkdelta.narod.ru/mr_ergoju_1.htm

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EQUATOR in Arkhangelsk region

October: 2000km

Scale: 1:5000

50m between lines

In cooperation with Aerogeophysica

bird's line path

Mi-8

Routes length 10km

Performed in a week!!!

140km/h speed

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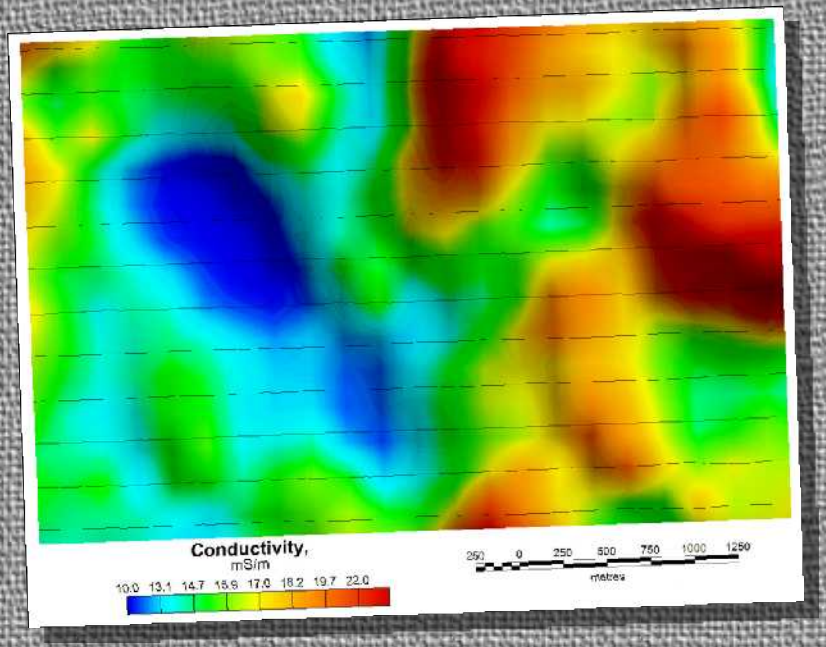
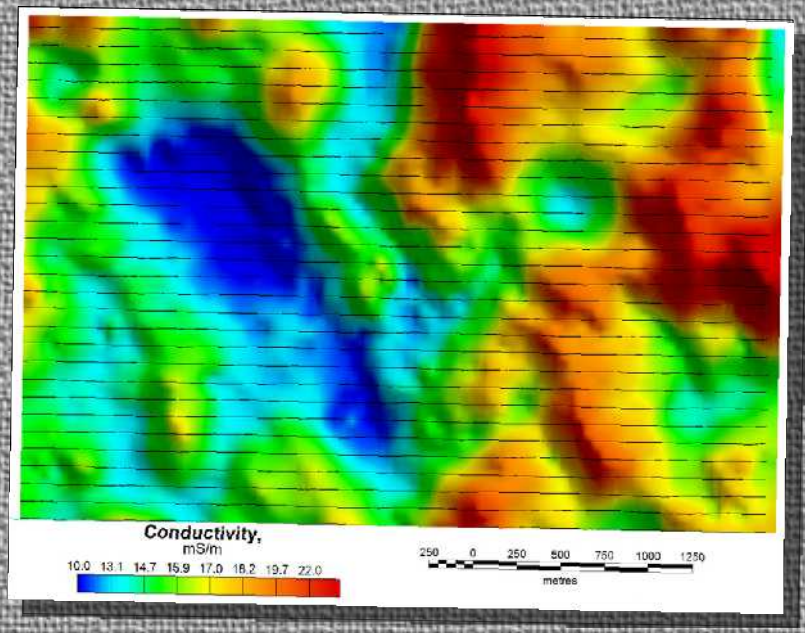
EQUATOR survey results: Arkhangelsk region

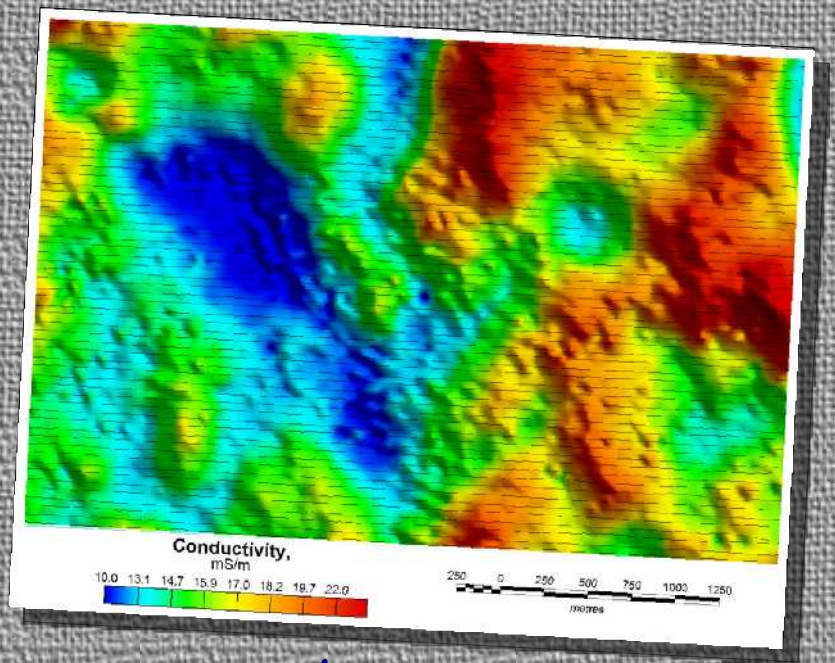




1:25000, apparent conductivity maps

1:10000

1:5000



By courtesy of Aerogeophysica

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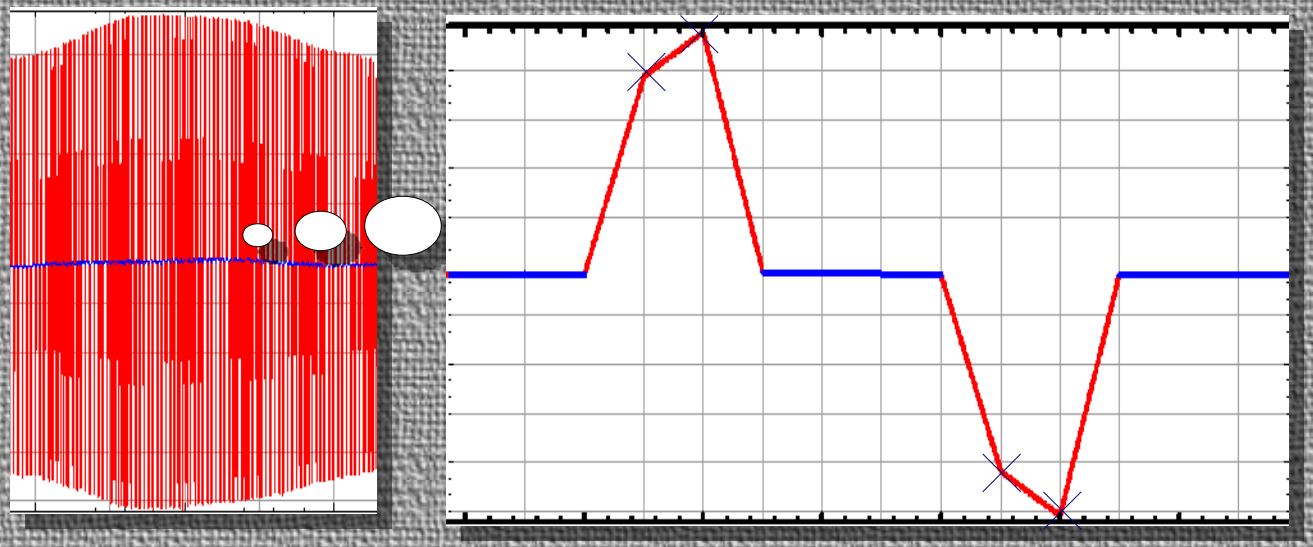
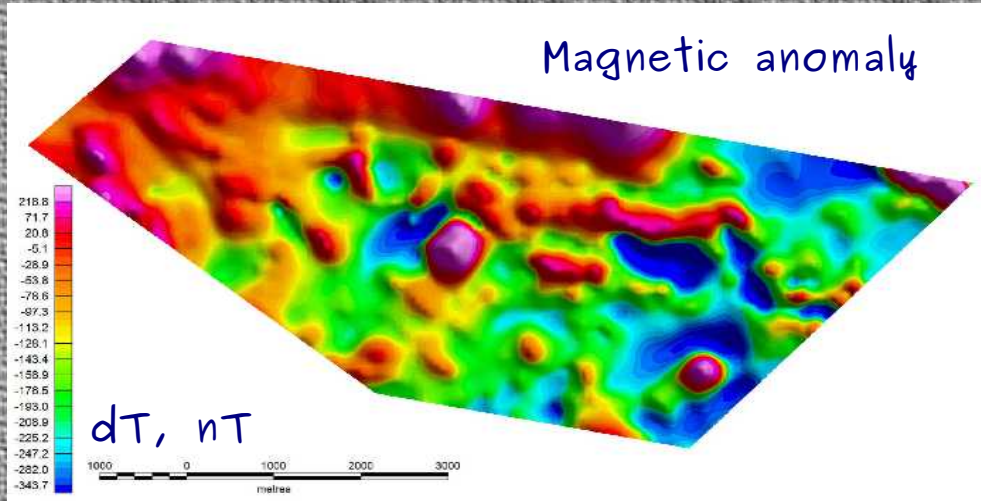
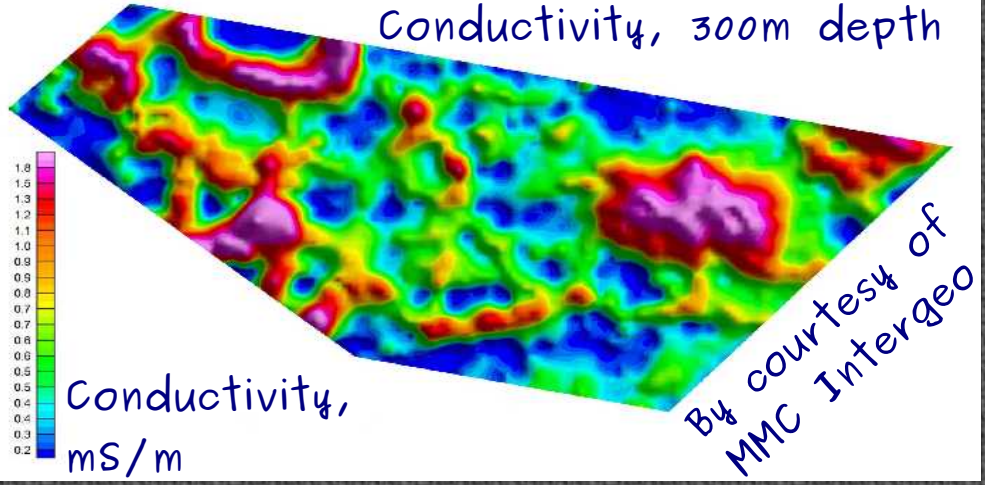
EQUATOR magnetic field measurements



GT-MAG: 1000 Hz
Non normalized 4th differences 0,05nT
(25 Hz output)
Sensor
GPS-positioning





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EQUATOR summary

B, dB/dt time-domain measurements (x,y,z)

high precision magnetic field measurements

navigation tasks solution:

- helicopter navigation along lines and during turns;
- bird positioning;
- transmitter-receiver and transmitter-ground;

frequency-domain measurements

77 Hz – 12 kHz

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THANK YOU!

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