



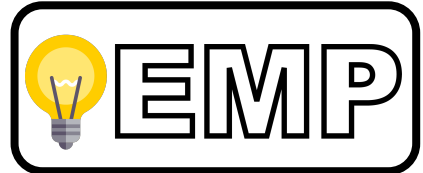
**The user guide EMinar**

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- Raw time series:**
- ASCII (\*.txtm \*.ts)
  - Phoenix (\*.tbl, \*.tbo, \*.tsX)
  - Metronix (\*.ats, \*.xml, \*.txt)
  - Crystal Globe (\*.atts, \*.apial)
  - VEGA (\*.dat, \*.log)
  - MicroKOR (\*.sbf, \*.txt)
  - LEMI (soon)

- Processed data:**
- SEG \*.edi, \*.plt  
transfer functions or spectra
  - EMTF Z-files
  - ModEM \*.dat files

**Project file \*.emp**



**Interactive data processing,  
correction and analysis**

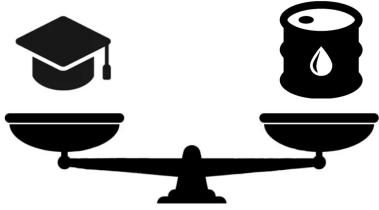
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- Raw time series:**
- ASCII (\*.txt)
  - Simple binary (\*.bin)
- Spectra:**
- Power spectra or cross spectra as ASCII text

- Processed data:**
- Transfer functions as ASCII text
  - SEG \*.edi transfer functions
  - EMTF Z-files
  - ModEM \*.dat files
  - MARE2DEM \*.emdata files
  - Rebocc \*.dep files
  - Mackie \*.dat files
  - Zond2DMT \*.z2d files

- Models for inversion:**
- 3D ModEM model constructor
  - 2D topo skeleton generator for MARE2DEM

# Good sides of the EMP



No matter where you are from: academy or industry env.  
It is free without limits.



Do you want to play with data? No problem.  
Change settings and compare results right here. Interact with data.



You can process data from different instruments jointly.  
For example for the Remote Reference processing.

# Bad sides of the EMP



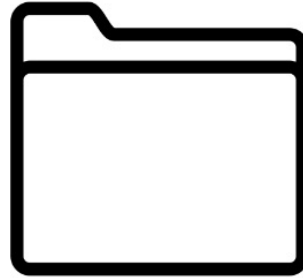
© Kazimir Malevich

# Three main types of inputs



**File**

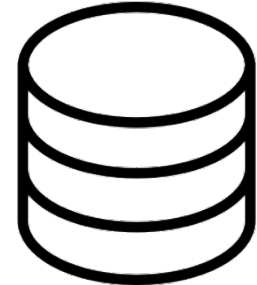
One or many INDEPENDENT files.  
Like EDI or time series with all  
channels and metadata INSIDE.



**Directory**

A directory containing a number  
of INTERCONNECTED files.  
Like ATS and XML or TS and  
TBL.

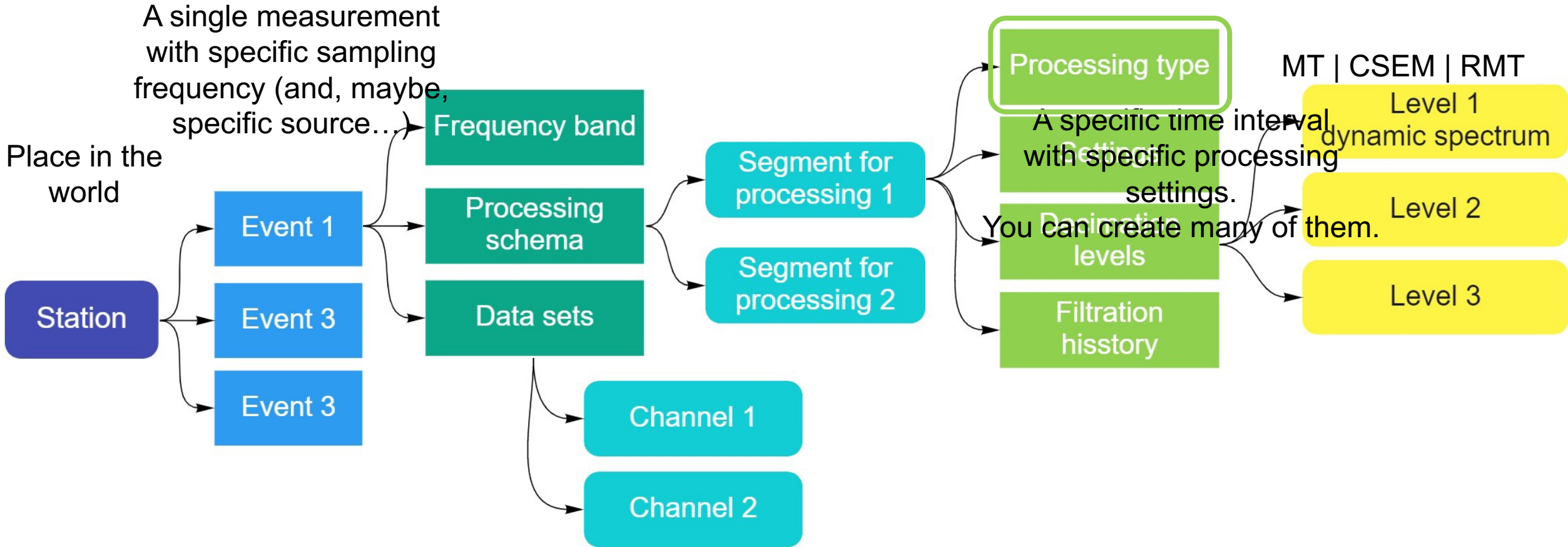
Be careful. The EMP will read  
ALL known data types exist in  
the directory including sub  
directories.



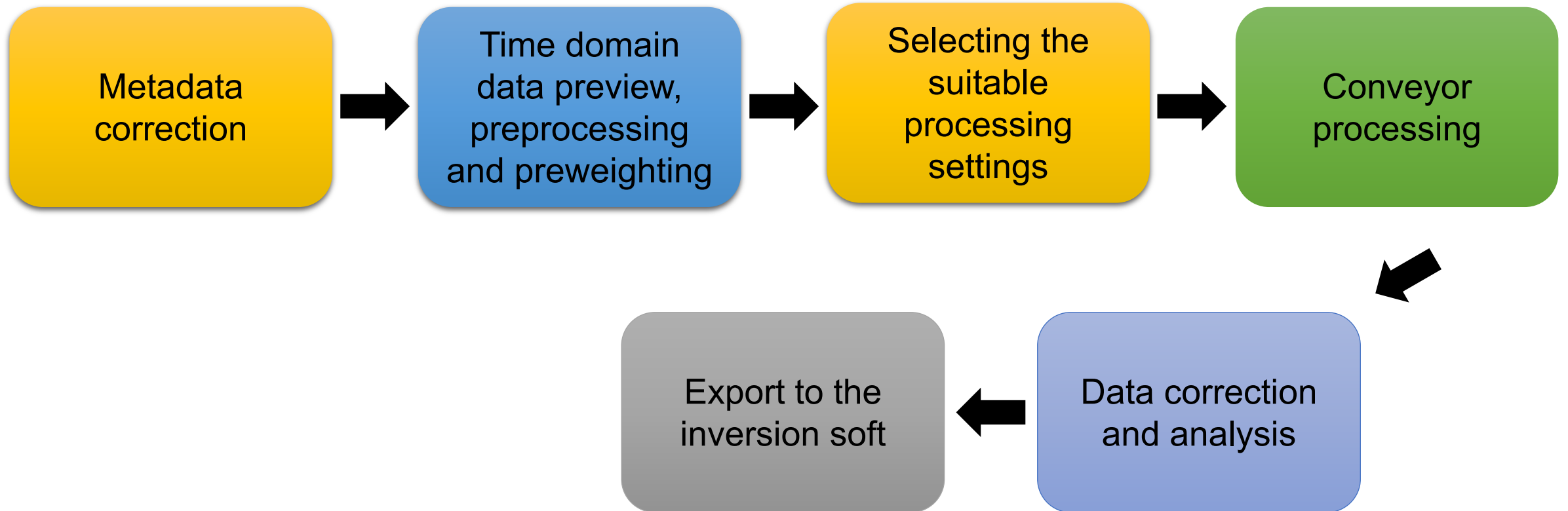
**Project**

Everything without raw time  
series. Only paths to them on  
your machine. Be careful. And  
no models yet...

# Data structure

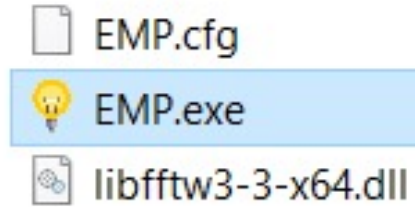


# Processing workflow

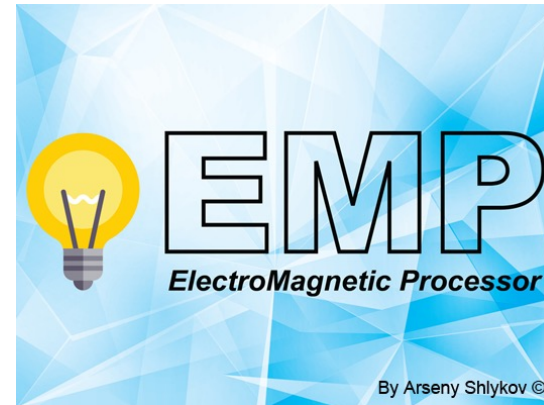


# Installation and running

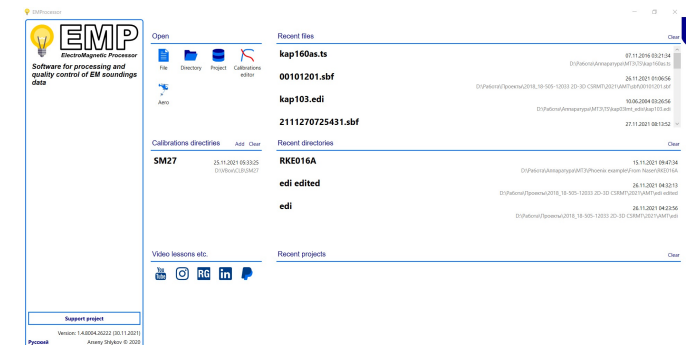
1. Download the zip archive and extract to the HDD (SSD).



2. Double click on the EMP.exe executable file.



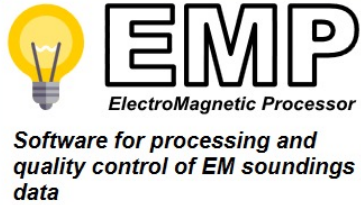
3. Wait couple of seconds.



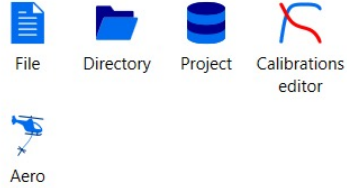


# Welcome screen

EMProcessor



## Open



## Calibrations directories

Calibrations directories	Add	Clear
<b>SM27</b>	25.11.2021 05:33:25	D:\VBox\CLB\SM27

## Video lessons etc.



[Support project](#)

Version: 1.4.8004.26222 (30.11.2021)

Русский

Arseny Shlykov © 2020

## Recent files

- kap160as.ts
- 00101201.sbf
- kap103.edi
- 2111270725431.sbf

## Recent directories

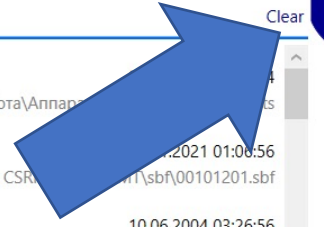
- RKE016A
- edi edited
- edi

## Recent projects

Clear


Recent files	Clear
D:\Работа\Аппаратура\MT3\TS\kap03lmt_edis\kap103.edi	10.06.2004 03:26:56
D:\Работа\Проекты\2018_18-505-12033 2D-3D CSRMT\2021\AMT\sbf\00101201.sbf	27.11.2021 01:08:56
D:\Работа\Проекты\2018_18-505-12033 2D-3D CSRMT\2021\AMT\edi edited	26.11.2021 04:32:13
D:\Работа\Проекты\2018_18-505-12033 2D-3D CSRMT\2021\AMT\edi	26.11.2021 04:23:56
D:\Работа\Аппаратура\MT3\Phoenix example\From Naser\RKE016A	15.11.2021 09:47:34





Clear



# Correction of the attributes

**Channels**

Event №1 Fs 160 Hz 01.03.2014 

	Type	ID	Gain	Length	Azimuth	Reverse
● !	Hy	721	35		90	<input type="checkbox"/> 
● !	Ex	455	35	100	0	<input type="checkbox"/> 
● !	Ey	455	35	100	90	<input type="checkbox"/> 
● !	Hx	723	35		0	<input type="checkbox"/> 

[Search calibrations](#)

[Correct declination](#)

**Description**

Station ID

Contractor

Address

**Coordinates**

Latitude

Longitude

Altitude

Line

Piket

You can change most of attributes:

- Type of channel
- Channels ID
- Gain
- Length (for E-line)
- Azimuth
- Direction
- Date-time of start of measurements
- Coordinates etc.



# Coordinates correction and coordinate system

- WGS84 coordinates only
- Don't forget about ruler. Ruler shows the geographical azimuth.

EMProcessor: D:\Работа\EMP\EMinar\Examples\Jablo

▼ Data coordinate system.

▼ Transmitters +

▲ Station:  

EDI 00000001

EDI 00002001

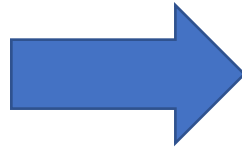
EDI 00004001

EDI 00006001






EDI 00008001

EDI 00010001

EDI 00012001







EMProcessor: D:\Работа\EMP\EMinar\Examples\Jablonovka\edi

     **Auto** 

Name	Latitude	Longitude	Altitude	East	North	Line	Piket
00000001	.000000	.000000	.00	.00	.00	0	0
00002001	.000000	.000000	.00	.00	.00	0	0
00004001	.000000	.000000	.00	.00	.00	0	0
00006001	.000000	.000000	.00	.00	.00	0	0
00008001	.000000	.000000	.00	.00	.00	0	0
00010001	.000000	.000000	.00	.00	.00	0	0
00012001	.000000	.000000	.00	.00	.00	0	0
00014001	.000000	.000000	.00	.00	.00	0	0
00016001	.000000	.000000	.00	.00	.00	0	0
00018001	.000000	.000000	.00	.00	.00	0	0
00020001	.000000	.000000	.00	.00	.00	0	0
00022001	.000000	.000000	.00	.00	.00	0	0

# Combining of the stations

Stations    


RAW RMT5 #25512 00800102 1 events

RAW RMT5 #25512 00800103 1 events

RAW RMT5 #25512 00800104 1 events

Info

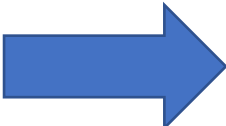
Channels





Event №1 Fs 39 kHz 11.10.1999 

Type	ID	Gain	Length	Azimuth	Reverse
Hy	504	16		330	<input type="checkbox"/>
Ex	52	16	10	60	<input type="checkbox"/>
Ey	52	16	10	330	<input type="checkbox"/>
Hx	506	16		60	<input type="checkbox"/>
Hz	508	16			<input type="checkbox"/>

Search calibrations

Correct declination





Stations    


RAW RMT5 #25512 00800102 3 events

Info

Channels

Event №1 Fs 39 kHz 11.10.1999 

Event №2 Fs 312 kHz 11.10.1999 

Event №3 Fs 2496 kHz 11.10.1999 

Type	ID	Gain	Length	Azimuth	Reverse
Hy	504	16		330	<input type="checkbox"/>
Ex	52	16	10	60	<input type="checkbox"/>
Ey	52	16	10	330	<input type="checkbox"/>
Hx	506	16		60	<input type="checkbox"/>
Hz	508	16			<input type="checkbox"/>

Search calibrations

Correct declination

# Time domain pre...

- Look at data
- Resample
- Filtration (notch, custom FIR, CSEM)
- Time domain quality estimation

Examples:

1. Resampling from 160 to 150 Hz (for time segment)
2. Inverse weights

# Selecting suitable processing settings

- Trimming the time series for the particular segment (timelines)
- Changing the frequency range
- FFT settings
- Estimator settings
- Rejection criteria (include/exclude)
- Selecting the remote reference event
- Testing several processors
- Different settings for different frequency ranges (manual decimator)

# Z-Y SS estimator

[Published: February 2007](#)

## Impedance-admittance regression analysis of magnetotelluric fields

[L. F. Moskovskaya](#)

[Izvestiya, Physics of the Solid Earth](#) **43**, 148–160 (2007) | [Cite this article](#)

# RMT processing


- Looking on the screen of the EMP...



# Tensor RMT processing

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## Estimation of magnetotelluric transfer functions from radio transmitters

Authors:  
M. Bastani and L. B. Pedersen

<https://doi.org/10.1190/1.1487051>

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0016-8033  
ISSN (online):  
1942-2156

# CSEM processing

- Selecting the current (reference) event or not.
- CSEM filter

# CSEM filter

*Geologica Acta, Vol.8, N° 1, March 2010, 31-49*

DOI: 10.1344/105.000001514

*Available online at [www.geologica-acta.com](http://www.geologica-acta.com)*

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## On processing of Controlled Source Electromagnetic (CSEM) Data

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OLEG V. PANKRATOV<sup>|1| |\*|</sup> and ALEXEY I. GERASKIN<sup>|2|</sup>

# Conveyor processing



# Conveyor processing

- Don't forget to apply settings for all stations.

# Data correction and analysis

- Looking on the screen of the EMP...

# Data export

1. Open EDI files with processed data.
2. Check the data coordinate system.
3. Select stations you want to export using the map.
4. Correct the topography and altitudes of the stations
5. Select format for export.

# Preparing a model for inversion

- Looking on the screen of the EMP...