KMS-200
Acquisition & Processing Software

KMS-200

KMS-200 Acquisition & processing software

KMS-200 is the most comprehensive acquisition & monitoring software with embedded processing to accompany the KMS-820 & LEMI-423-4 systems. With some basic steps, the user can visualize data and response parameters (i.e., in MT: apparent resistivity & phase). For CSEM it can QA/QC, filter and stack the data. It can also do 1D inversions and generate the output for 3D inversion for MT and CSEM data. KMS-200 software helps users go from acquisition, data QA/QC to processing, all in one platform. KMS-200 is easy to use with default workflows and with our integrated services for 1D, 2D and 3D inversions, our group of experts will guide you step by step. KMS-200 is optimized for MacOS, with speeds 10x faster for systems with Apple M1 chip.

KMS-200 software works with MT data from KMS-820 MT system (left), LEMI-424 system (middle) or KMS-820 CSEM system (right)

Software products

1. **Acquisition software: KMS-200-ACQ**   for KMS-820 only
   - o   Receiver acquisition control & monitor
   - o   Acquisition scheduler
   - o   Sensor calibration
2. **Transmitter control & monitor software: KMS-200-TX**   for KMS-820 only
   - o   Transmitter control & monitor
   - o   Pre-defined & customized transmitter waveform
   - o   Special transmitter safety feature
3. **Basic robust MT processing software: KMS-200-P**   for KMS-820 only
   - o   Robust MT processing
   - o   Standard MT processing workflow
4. **Fast robust processing software: KMS-200-AP**   for KMS-820 & LEMI-423-4
   - o   Fast robust processing
   - o   Adjustable processing parameter
   - o   Batch processing mode
   - o   Improved graphic display
5. **1D MT inversion software: KMS-200-IX1D**   for KMS-820 & LEMI-423-4
   - o   IX1D MT sounding inversion
   - o   Graphic display of apparent resistivity & impedance phase
6. **2D MT inversion software: KMS-200-ZONDMT2D**   for KMS-820 & LEMI-423-4
   - o   Zond 2D MT inversion
7. **OPTION KMS** instead of 5 & 6 above: 1D & 2D Inversion for MT   for KMS-820 & LEMI-423-4
8. **3D EM inversion: KMSProInv3D**   for KMS-820 & LEMI-423-4
   - o   For MT data
   - o   Only available through KMS cloud
9. **TEM processing software: KMS-200-tCSEM™**   for KMS-820 only
   - o   KMSPro tCSEM™ processing (lease only)

Software bundles (collection of software product application/price optimized)
10. **KMS-200 MT Bundle 1**: includes KMS-200-ACQ, KMS-200-P, KMS-200-AP, & KMS-200-IX1D
11. **KMS-200 MT Bundle 2**: all in Bundle 1 plus KMS-200-ZONDMT2D
12. **All bundles can be supplied with KMS Option: 1D, 2D, 3D inversion** (3D inversion provided through KMS cloud, includes first 100 sites for free)

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Software features

➢ Available for all operating systems: **Windows** 32 and 64-bit, **MacOS** (optimized for faster speeds in systems with Apple M1 chip), **Linux**
➢ Time series editing
➢ Data processing (single site and remote reference) and visualizing of MT parameters
➢ Calculate impedance, resistivity, phase and other MT parameters like skew, tipper, polar diagram, induction arrow etc. and plotting
➢ Real-time acquisition & monitoring software
➢ Quality assessment of CSEM data
➢ Export to numerous industry standard formats including: EDI, VTK, SEGY, miniSEED, ASCII, BIN
➢ 1D inversion: Ultra-fast transformation based, IX1D Interpex Ltd (included), SVD based Occam inversion with numerous regularization options (optional)
➢ CSEM data processing (Lotem, FSEM) - KMSPro
Options:
➢ TFEM & Induced polarization (time domain)
➢ KMS 1D & 2D inversion
➢ KMS 3D MT inversion (only through KMS cloud)
➢ Others upon request
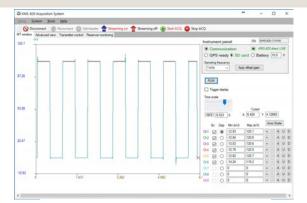
Acquisition software

Acquisition control window

Transmitter control window

➢ Control both receiver & transmitter
➢ Customized acquisition scheduler
➢ Sensor Calibration function
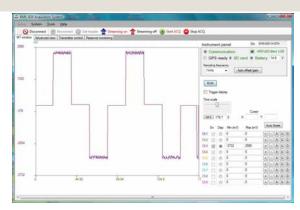➢ Quick-start windows for MT & CSEM

➢ Data saturation protection
➢ Work with 32-bit KMS-831 modules
➢ High speed Wi-Fi stream data to cloud
➢ Special CSEM safety feature

Monitoring receiver & transmitter

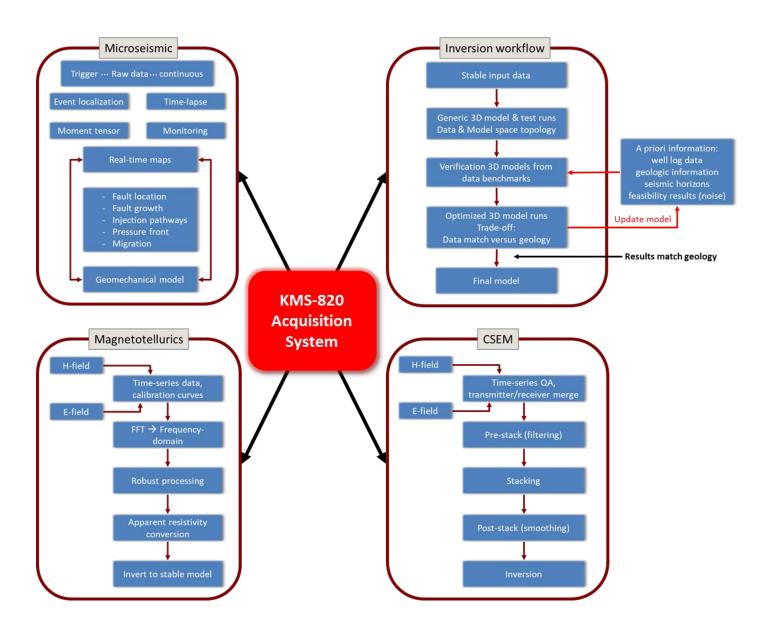**Receiver real-time monitoring**
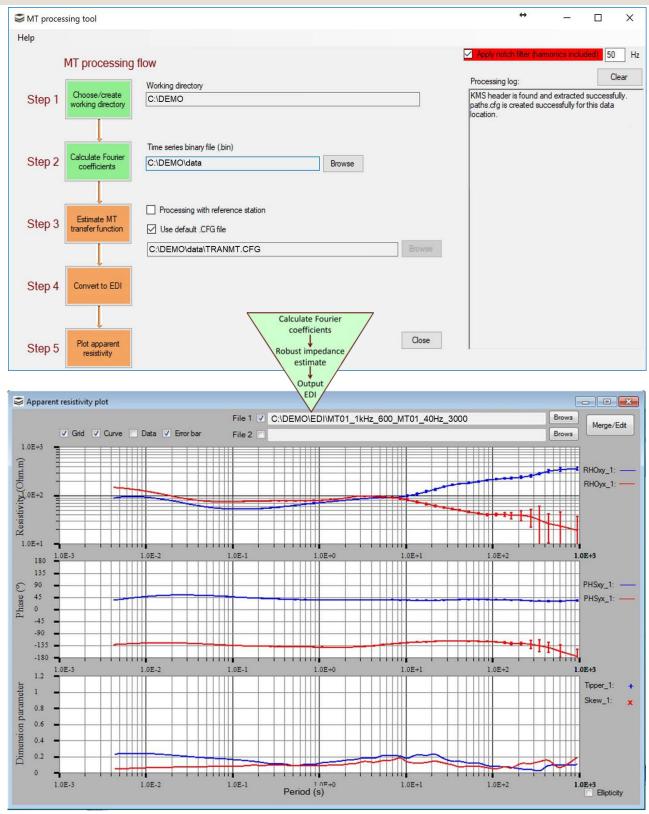

Transmitter real-time monitoring

Transforming complexity to simplicity

The KMS-820 array data acquisition system has - from the ground up - been conceptualized as a next-generation, integrated data gathering unit. Today, this data integration has reached into the multi-physics domain. By combining the data acquisition of seismic and electromagnetic signals in a single unit we can take advantage of the strong synergy and complimentary nature of electromagnetic and microseismic data and enrich their interpretation.

Integrated acquisition of electromagnetic (EM) and microseismic data provides a unique tool to help reduce risk and improve productivity in reservoir monitoring. For example, in enhanced geothermal systems (EGS) microseismic monitoring allows for the imaging and visualization of active fracture networks within developing and producing EGS, while the EM response will differentiate the heated fluid flow regimes. This outlines the active and future commercial EGS areas.
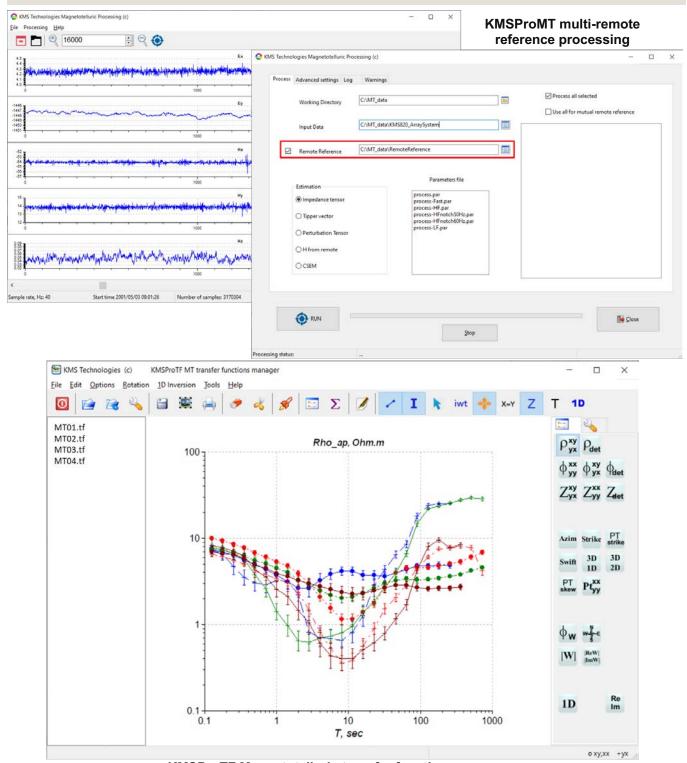
Basic robust MT processing

MT processing workflow, similar workflow is used for other methods

References:

Egbert., G. D. (1986). Robust estimation of geomagnetic transfer functions. *Geophys. J. R. Astron. Soc.*, 87, 173-194.

Egbert, G. D. (1997). Robust multiple-station magnetotelluric data processing. *Geophys. J. Int.*, 130, 475-496.

Eisel, M. & G. D. Egbert (2001). On the stability of magnetotelluric transfer function estimates and the reliability of their variances. *Geophys. J. Int.*, 144, 65-82

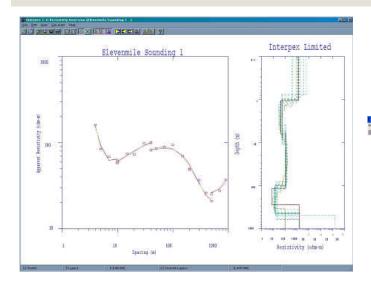# Advanced MT processing – KMSProMT & KMSProTF

KMSProMT multi-remote reference processing

**KMSProTF Magnetotelluric transfer functions manager,
multi-remote reference apparent resistivity plots**

References:

Smirnov, M. Yu. (2003). Magnetotelluric data processing with a robust statistical procedure having a high breakdown point. *Geophys. J. Int.*, 152, 1-7.
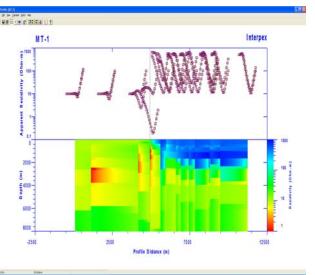
KMS-200 has two types of inversion

1: 3rd party inversion software integrated with common model/map framework (1D, 2D and 3D inversion). We use Interpex (1D) Zond (2D) or Modem Geophysics (3D)

2: KMSpro simplified inversions: easy to use almost automatic inversions (1D, 2D as executable; 3D inversion provided by KMS via CLOUD)

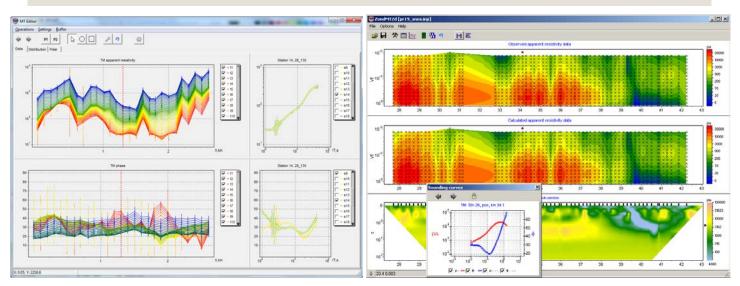## 1D inversion – IX1D (3rd party INTERPEX Ltd)

IX1D Sounding graphics window screen

IX1D Display of MT Data with apparent resistivity data displayed as curves, synthetic displayed as lines and smooth model displayed as a colored
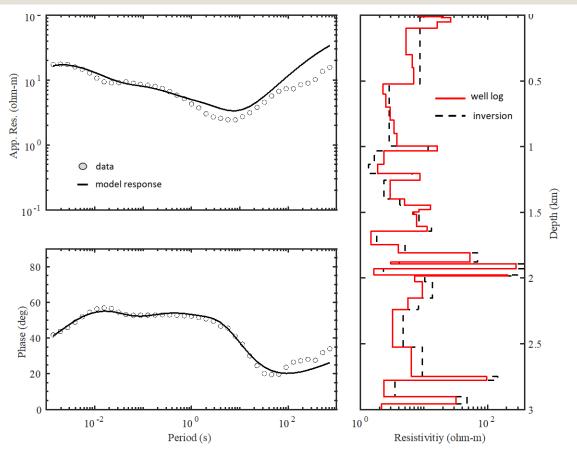
2D MT inversion – Zond2D (Add-on 3rd party - ZOND)
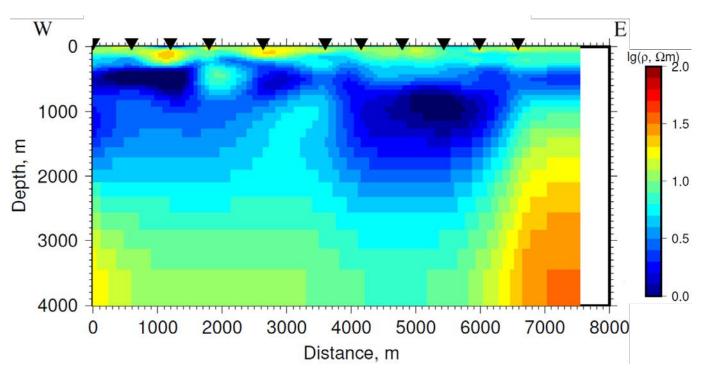

MT editor for data filtration, analysis & rotation

Resistivity 2D MT inversion in Zond2D

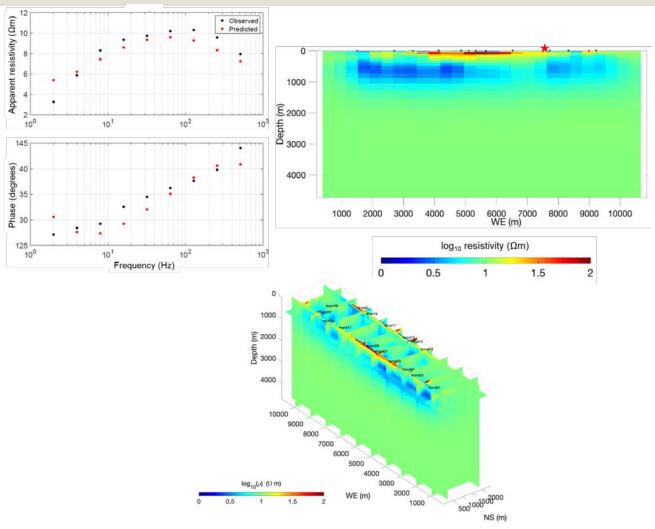# Simple 1D & 2D inversion (KMS option alternate to above)

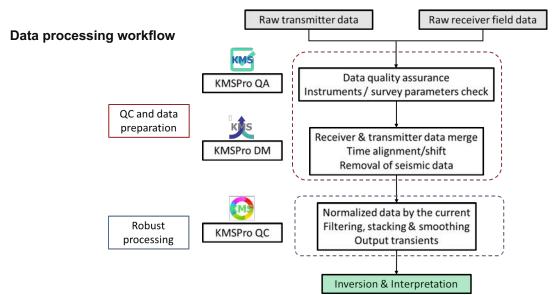**1D determinant inversion of MT data processed with remote reference**
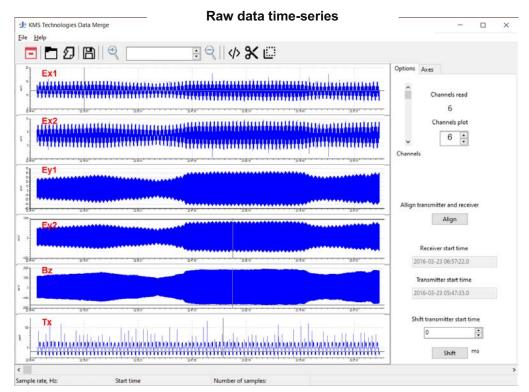

Resistivity profile of 2D MT inversion

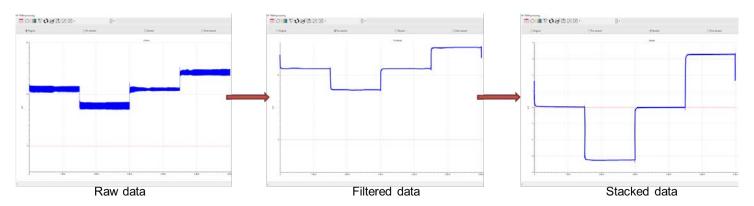# 3D inversion - KMSProInv3D (KMS option)

3D inverted data & resistivity model with KMSProInv3D

tCSEM™ processing - KMSPro

Data processing workflow

Raw data time-series

Filtered & stacked data

| Raw data | Filtered data | Stacked data |

Order Information

Software bundles

1. **KMS-200 MT Bundle 1**: includes KMS-200-ACQ, KMS-200-P, KMS-200-AP, & KMS-200-IX1D
2. **KMS-200 MT Bundle 2**: all in Bundle 1 plus KMS-200-ZONDMT2D

Both above with KMS option:

3. **KMS-200 MT Bundle 1 – KMS:** includes KMS 1D inversion)
4. **KMS-200 MT Bundle 2 – KMS:** includes KMS 1D, 2D, 3D inversion (100 free sites via KMS cloud)
5. All inversion can also be provided via KMS CLOUD access services

Individual software products

7. KMS-200-ACQ: Acquisition software for KMS-820 only
8. KMS-200-TX: Transmitter control & monitor software for KMS-820 only
9. KMS-200-P: Basic robust MT processing software for KMS-820 only
10. KMS-200-AP Fast robust processing software: for KMS-820 & LEMI-424
11. KMS-200-IX1D: 1D MT inversion software for KMS-820 & LEMI-424
12. KMS-200-ZONDMT2D: 2D MT inversion software for KMS-820 & LEMI-424
13. KMS-200-tCSEM™ : TEM processing software for KMS-820 only

Please contact info@KMSTechnologies.com for more information and get your customized quote today!