IRIS INSTRUMENTS

MULTI-FREQUENCY ELECTROMAGNETIC SYSTEM

PROMIS

MULTI - FREQUENCY

MULTI - SPACING

3 COMPONENT EM SYSTEM

for SOUNDING & PROFILING

PROMIS MAIN FEATURES

- **PROMIS** is a slingram HLEM system using a **transmitter loop** to produce a primary magnetic field, linked by a cable to a **receiver sensor** located at a given spacing from the transmitter; the system measures the three in-phase and out-of-phase components of the secondary magnetic field induced in the ground by conductive structures. The profile is carried out by measuring a set of frequencies at each station, and by moving both the transmitter and the receiver to the next station.
- **The depth of penetration** depends on the separation (spacing) between the transmitter and the receiver and on the frequency. It is usually considered as of the order of half the spacing.
- **The receiver unit** controls the system and automatically carries out the readings for the set of frequencies, without any intervention of the operator and voice communication between transmitter and receiver. Two leds indicate when the transmitter has to move to the next station. Two inclinometers correct for deviations from horizontal position. A GPS unit can be connected
- **The productivity** is increased by this automatic process. The selection of the frequencies and the stacking parameters is made at the beginning of the survey for optimizing the field work.
- **The EMSYS** software transfers, processes and displays the data
- **The PROMIS** is available with **one component** (vertical) or with **three components** (vertical & two horizontal); the 3 component version gives more information on the geological structure.

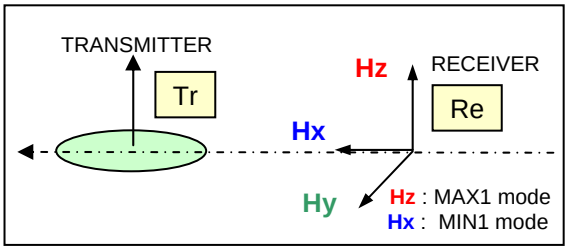
PROMIS, FREQUENCY HLEM PROFILING SYSTEM

for detecting resistivity changes:

- conductive dykes in mining
- fractured zones in groundwater

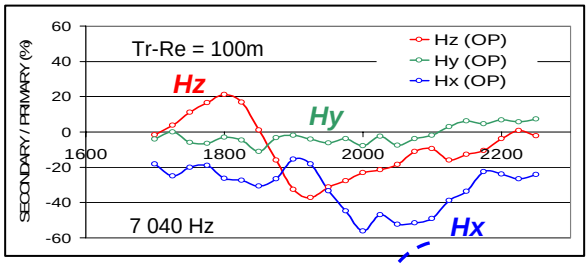
TEN FREQUENCIES:
110 Hz to 56 kHz
Tr-Re SPACING RANGE:
20 to 400m
MAGNETIC FIELD COMPONENTS:
vertical Hz & horizontal Hx, Hy

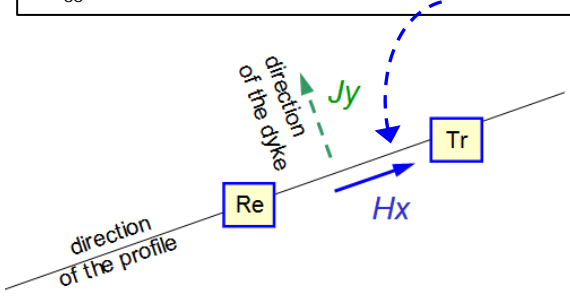
- IMPROVED PRODUCTIVITY
- EASE OF OPERATION
- MULTI- FREQUENCY SYSTEM
- 3 MAGNETIC COMPONENT DATA



Hz: localization & dip of structure

Hx, Hy: direction (strike) of structure



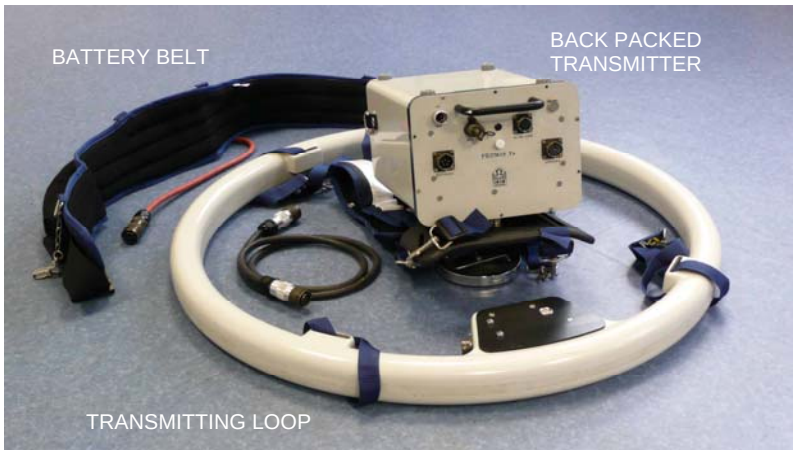


WHY MEASURING 3 MAGNETIC COMPONENTS?

* **traditionnal** HLEM slingram systems measure the **vertical component** of the magnetic field, which permits to locate the places where a conductive structure is intersected.

* with the additional measurements of the **two horizontal components**, the **PROMIS** system permits to give an information on the direction (strike) of the structure

PROMIS multi frequency EM system

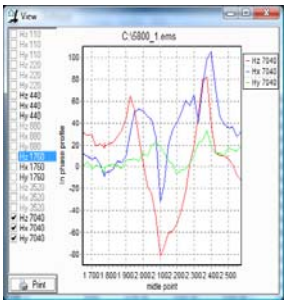


PROMIS STANDART ACQUISITION TIMES		
for one station	100m spacing	200m spacing
3 frequencies	**20s**	**30s**
10 frequencies	**50s**	**80s**

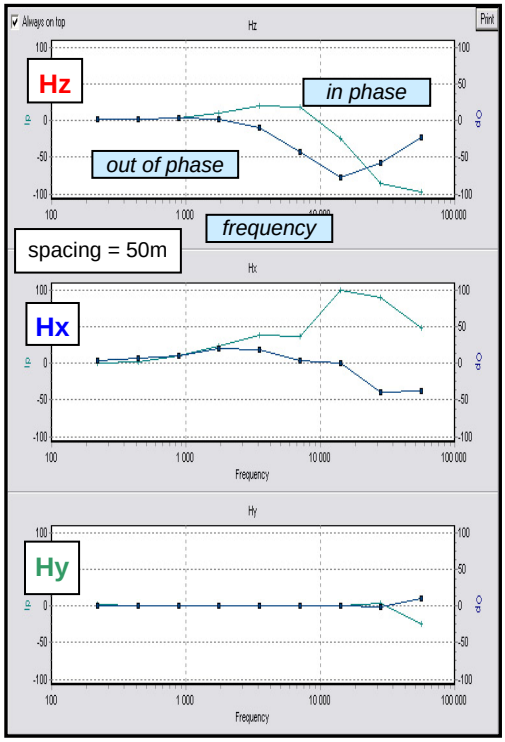
Hz

EMSYS software (data processing)

- transferring
- editing
- filtering
- plotting: *sounding, profiling*
- exporting



display of profiling data for selected components and selected frequencies



frequency sounding data at a given station

PROMIS

TECHNICAL SPECIFICATIONS

TRANSMITTER

- Power supply: NiMh battery belt (10 Ah)
- 200 readings typ. autonomy for 10 frequencies
- 500 readings, 3 freq., 100m spacing, at 20°C
- 10 frequencies from 110 Hz to 56 320 Hz
- Magnetic moments:
  - 360 Am2 @ 110 Hz
  - 320 Am2 @ 220 Hz
  - 280 Am2 @ 440 Hz
  - 235 Am2 @ 880 Hz
  - 220 Am2 @ 1 760 Hz
  - 160 Am2 @ 3 520 Hz
  - 110 Am2 @ 7 040 Hz
  - 60 Am2 @ 14 080 Hz
  - 30 Am2 @ 28 160 Hz
  - 15 Am2 @ 56 320 Hz
- 2 inclinometers for horizontal position
- 2 leds, green & red for end / start of reading
- Back packed transmitter: 30x20x20cm, 5.8kg
- Loop: 75cm diameter, 7kg; Battery belt: 4kg
- Optional loop: 1.3m diameter, 12kg, for doubling the magnetic moments of the 75cm loop

RECEIVER

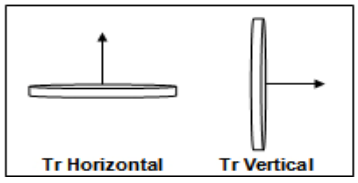
- Control of complete system by microprocessor
- Four simultaneous channels for 3 magnetic components Hx, Hy, Hz, and the current
- Selection of number of frequencies to measure
- 16 key keyboard: graphic display 12cm diagonal
- A/D converter: 16 bits; dynamic range: 24 bits
- Resolution: 0.01% of primary field
- 50 Hz notch filters; overload detection
- 2 inclinometers for horizontal position, gps input
- Power supply: internal NiMh battery
- Autonomy: 900 data of 10 frequencies (20°C)
- Temperature range: -20°C, +70°C
- Dimensions: 30x15x20cm; weight 5kg
- Magnetic sensor: 20x20x20cm, 2.6kg

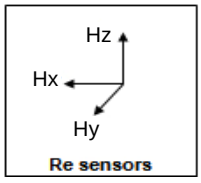
MEASURING PROCESS

- Digital synchronous detection
- Digital filtering of harmonics
- Computation of received frequency
- Processing for eliminating noisy data
- Selection of stacking number for each frequency
- Data storage: 20 000 readings capacity
- Stored parameters: in-phase and out-of-phase parts of the three magnetic components Hx, Hy, Hz, standard deviation, tilt angles of transmitter & receiver, battery levels, temperature, gps data

TRANSMITTER RECEIVER CABLE

- Cable for distance setting, for transmitter control and for phase reference
- Length: 20, 50, 100, 200, 400m, other on request





possible orientations of the transmitter loop

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