KMS Technologies – KJT Enterprises, Inc.

Appendix 7
Color Figures

from

Strack, K.-M., 1992, *Exploration with Deep Transient Electromagnetics*: Elsevier, 373 pp.

Appendix 7
Color Figures

Following are the descriptions for the figures on the next two pages.

Fig.A7.1   Example of colour resistivity sections derived with *Occam inversion*. The top section shows the display of the inversion results as they are output. The center frame shows the same data after filtering it with a lowpass filter with a width of half of the total depth. This filter is applied horizontally. For the bottom frame only every third data set was used simulating sparse measurements.

Fig.A7.2   Comparison of different inversions using single sets of the synthetic data. On the left column the starting model was without the resistive unit, on the right column the resistive unit was included from the beginning on. Both layer thickness and layer resistivity were allowed to vary during the fitting procedure.

Fig.A7.3   Comparison of different inversions using single sets of the synthetic data. On the left column the starting model was without the resistive unit, on the right column the resistive unit was included from the beginning on. The layer resistivities were allowed to vary during the fitting procedure, while the layer thicknesses were forced to stay at the preset values. This simulates the use of a priori information from seismics.

Fig.A7.4   Comparison of different *joint inversions* using combinations of the synthetic data sets for increased resolution. On the left column the starting model was without the resistive unit, on the right column the resistive unit was included from the beginning on. The layer resistivities were allowed to vary during the fitting procedure, while the layer thicknesses were forced to stay at the preset values. This simulates the use of a priori information from seismics.
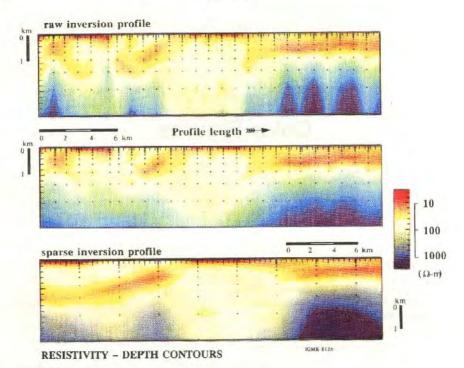
Appendix 7

raw inversion profile

Profile length ⟫⟫→

sparse inversion profile

RESISTIVITY – DEPTH CONTOURS

IGMK 813h

Fig.A7.1

INVERSION RESULTS OF INDIVIDUAL COMPONENTS

left starting model   model   right starting model

magnetic field   magnetic field

electric field   electric field

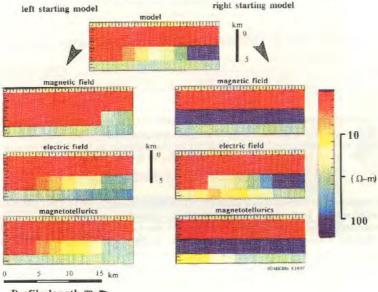magnetotellurics   magnetotellurics

IGMKbin 81590

Profile length ⟫⟫→

Fig.A7.2

INVERSION OF INDIVIDUAL COMPONENTS (structure fixed)

Fig.A7.3

JOINT INVERSION OF INDEPENDENT COMPONENTS (structure fixed)

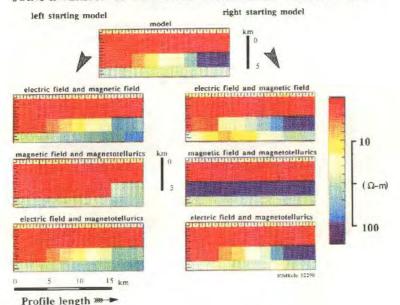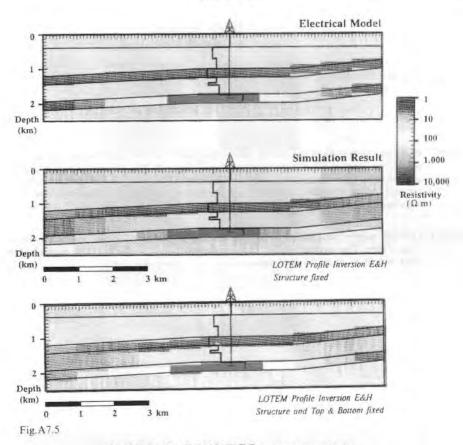
Fig.A7.4

Following are the descriptions for the figures on the next pages.

Fig.A7.5 Geoelectrical model (top) and inversion results for the joint inversion (along a profile) of
          the electric and magnetic field components keeping the structure fixed from the seismic a
          priori information (middle).In addition to the procedures for the center frame, for the
          bottom frame the bottom and top resistivities were kept fixed.

Fig.A7.6 Comparison of current flow patterns for a conductive layer (left, 1 Ωm, 500 m thick) and a
          resistive layer (right, 400 Ωm, 500 m thick) embedded at 2 km depth in a half space of
          intermediate resistivity (20 Ωm). The colours represent areas of equal current density. The
          induction currents are flowing perpendicular to the plane of the figure. The dashed lines
          are the contours of the return currents with opposite sign. Time increases from top to
          bottom on both sides, from 0.01 s to 1 s. In both cases vertical and lateral moveout can be
          observed, but is faster for the resistive case on the right.

Fig.A7.5

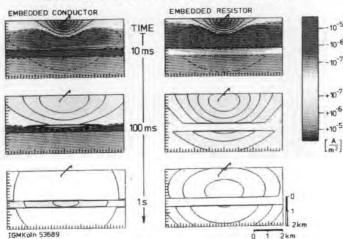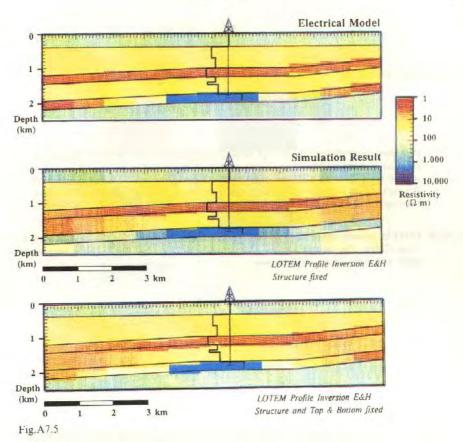**CURRENT DENSITIES, VERTICAL SECTION**

IGMKoln 53689

Fig.A7.6
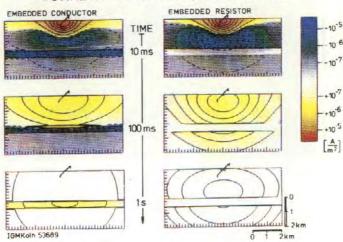
Fig.A7.5

CURRENT DENSITIES, VERTICAL SECTION

Fig.A7.6

Following are the descriptions for the figures on the next pages.

Fig.A7.7   Plan view time–slices of the charge density distribution at the top of the second layer for the conductive (left) and resistive (right) models of figure 2. The difference in resistivity of the second layer (left – 1 Ohm–m; right – 400 Ohm–m) causes a charge distribution of opposite sign, which points in the direction of the vertical electric field. The transmitter dipole is sketched in the center of each frame.

Fig.A7.8   LOTEM current image of a profile parallel to a seismic line for the case history from Tai Xing, China. The seismic section is superimposed. Note that the LOTEM source image was done with only about 30 data sets.
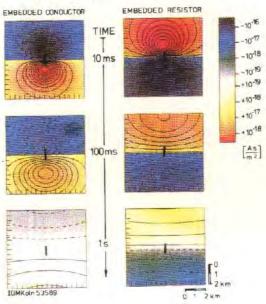
CHARGE DENSITIES

PLAN VIEW OF TOP 2ND LAYER

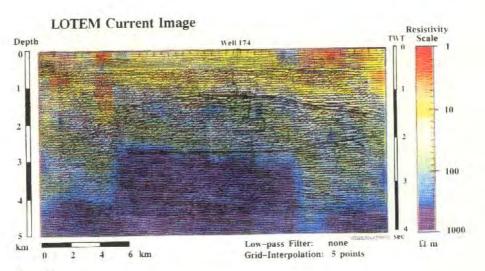

Fig.A7.7

LOTEM Current Image

Fig.A7.8

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