INITIAL ANALYSES

TITAN-24 Distributed Array System

for DC RESISTIVITY & INDUCED POLARIZATION Surveys

over the

SHIVEE TOLGOI PROJECT,
Ömnögovi Aimag,Mongolia,

by

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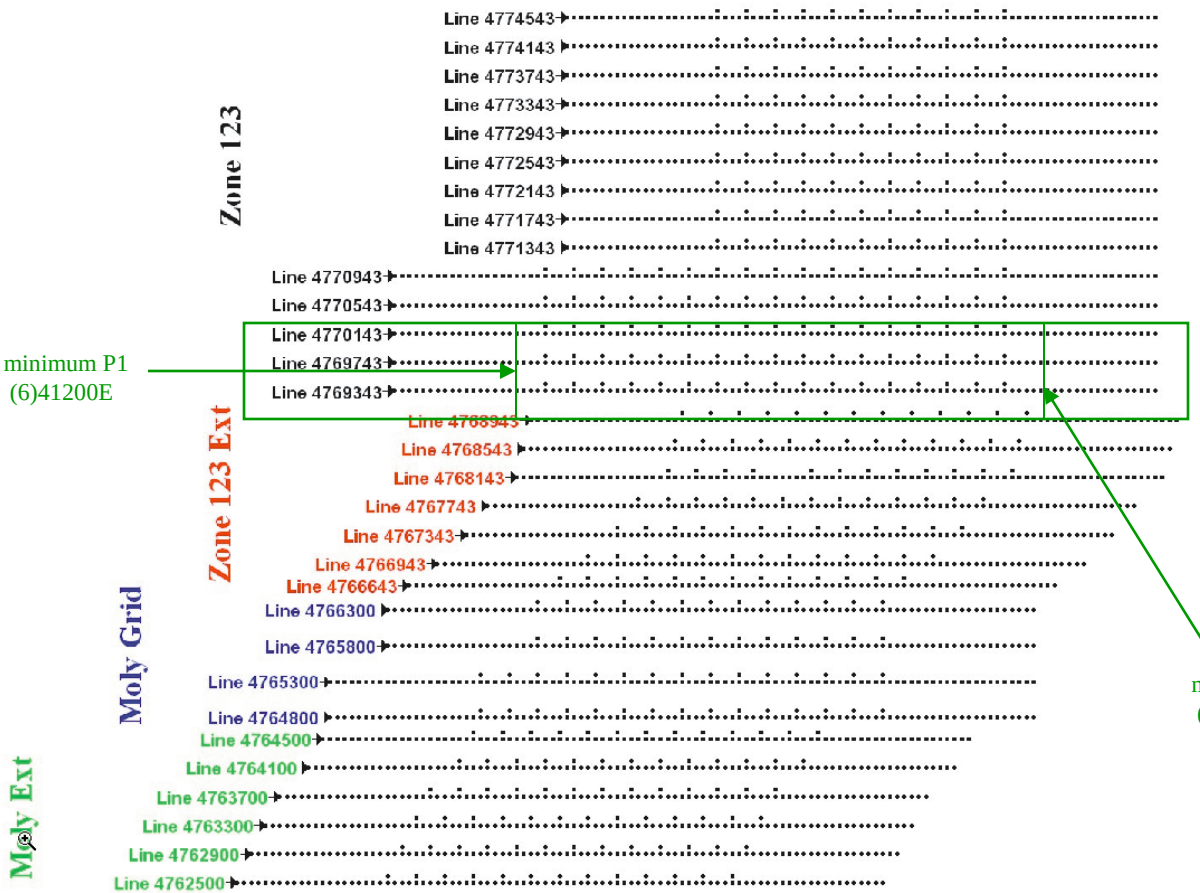
April 10, 2006 updated April 27, 2006 updated May 10,2006

Preamble:

Portions of the Titan24 Resistivity/IP data along with a Geosoft database were delivered to the consultant late in March, 2006. The consultant was instructed to review a portion of the data and the inverse images delivered by Quantec.

The main intention of the work was to determine if the inversions provided were sufficiently reliable upon which to build a drilling program. Secondly, if this were not the case, how might the data be utilized to provide sufficient information to provide good statistical information for deep drilling.

Data Summary



Data Summary

3.4.2 Zone 1,2,3 Grid

LINE	SETUP	MIN C1	MAX C1	POLE C2	MIN P1	MAX P2	TOTAL (m)
L-4769343N	1	639500E	647700E	(4)	641200E	646000E	4800
L-4769743N	1	639500E	647700E	(4)	641200E	646000E	4800
L-4770143N	1	639500E	647700E	(3)	641200E	646000E	4800
L-4770543N	1	639500E	647700E	(3)	641200E	646000E	4800
L-4770943N	1	639500E	647700E	(2)	641200E	646000E	4800
L-4771343N	1	639500E	647700E	(2)	641200E	646000E	4800
L-4771743N	1	639500E	647700E	(2)	641200E	646000E	4800
L-4772143N	1	639500E	647700E	(2)	641200E	646000E	4800
L-4772543N	1	639500E	647700E	(2)	641200E	646000E	4800
L-4772943N	1	639500E	647700E	(2)	641200E	646000E	4800
L-4773343N	1	639500E	647700E	(2)	641200E	646000E	4800
L-4773743N	1	639500E	647700E	(2)	641200E	646000E	4800
L-4774143N	1	639500E	647700E	(2)	641200E	646000E	4800
L-4774543N	1	639500E	647700E	(2)	641200E	646000E	4800
						Total (km)	67.2

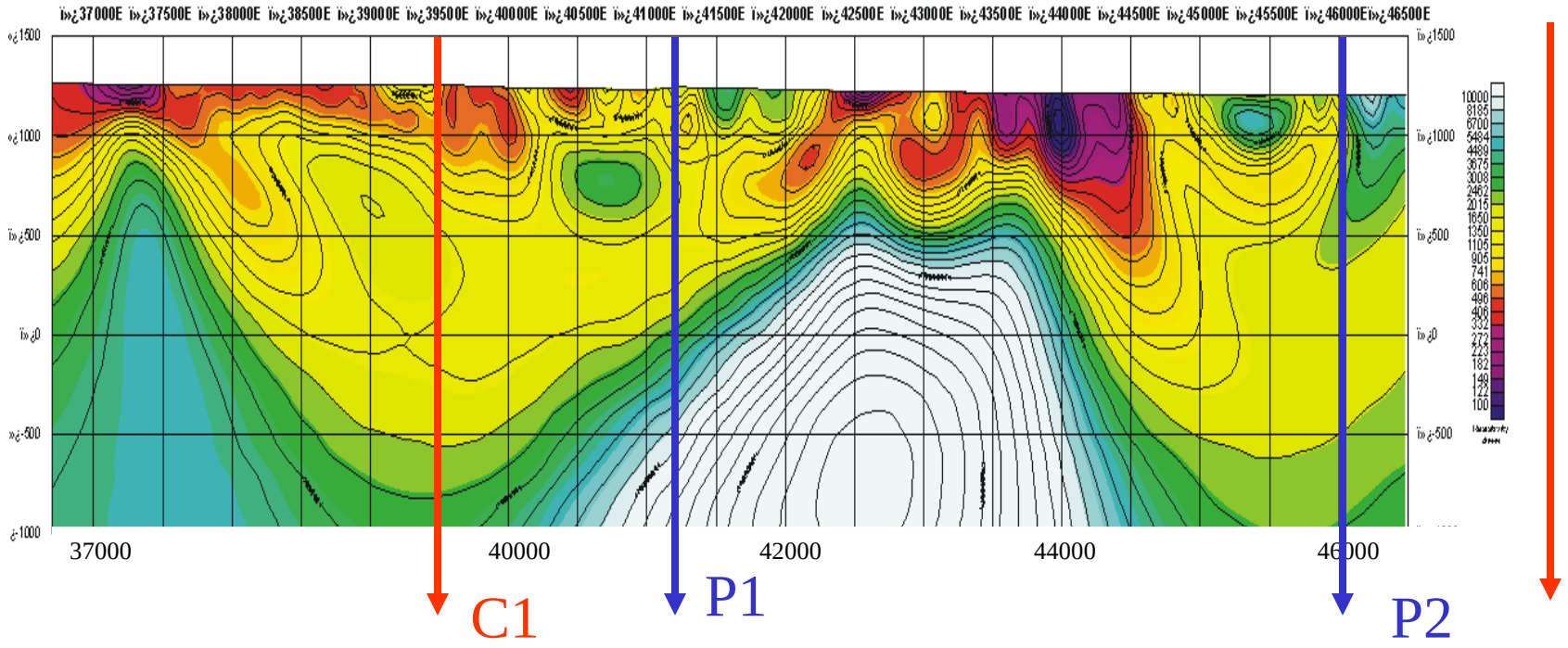
(2) Pole C2 ("infinity"): 646646E; 4782850N (WGS 84, Zone 48T)
(3) Pole C2 ("infinity"): 646287E; 4780972N (WGS 84, Zone 48T)
(4) Pole C2 ("infinity"): 645928E; 4779773N (WGS 84, Zone 48T)

Table VII: Zone 1,2,3 Grid Minimum and Maximum DCIP-PDP Electrode Positions

The data consists of 32 different current offsets from 100m to 6300m and two different source current polarizations.

Inversion Analyses

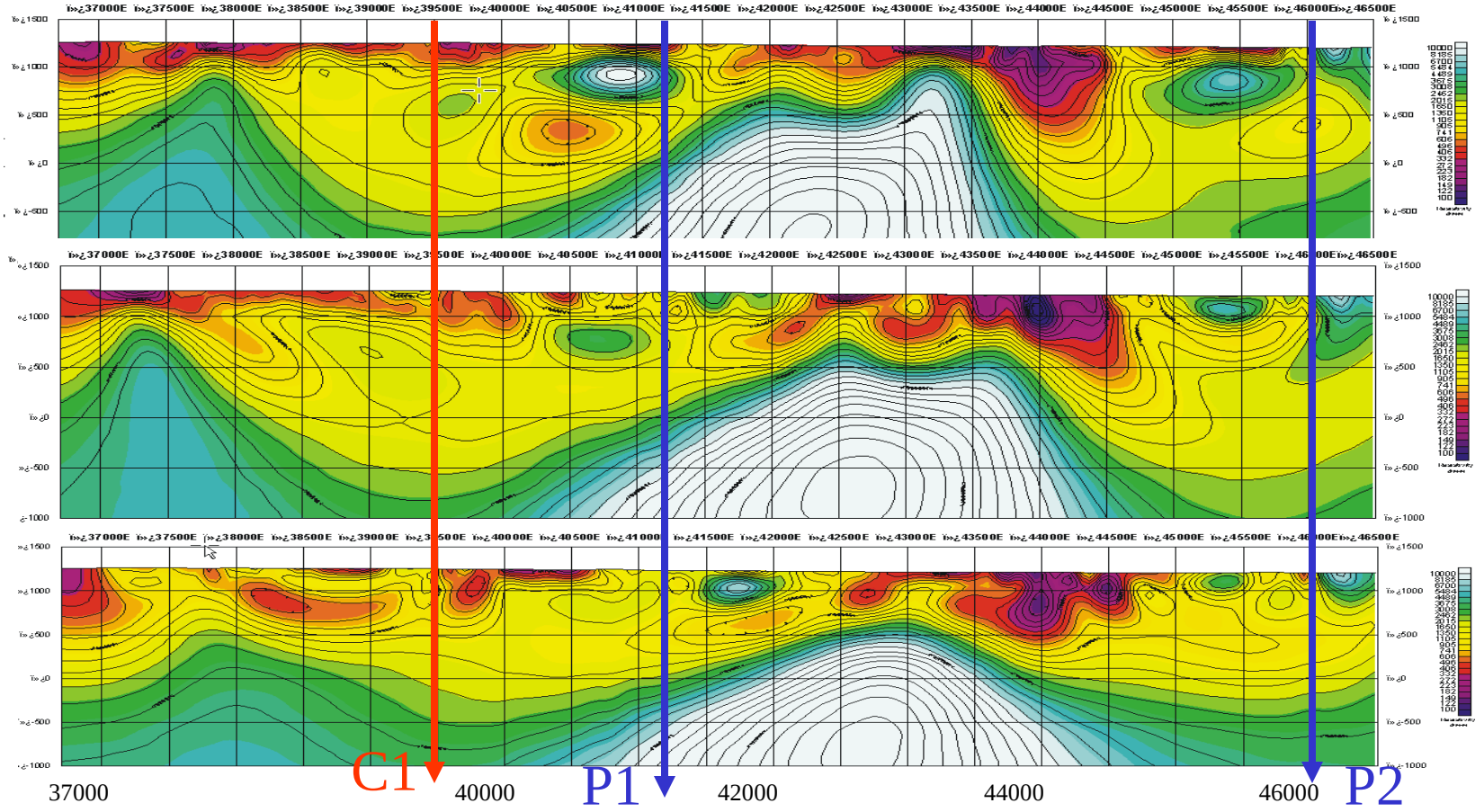
DC Resistivity Inversion – Line L-4769743N



Questions: Inversions generally show structure outside of the "normal" ground excitation range. This is particularly true to the west where there is a significant structure even to the west of the most westerly current pole. This is not to suggest that the data is not subject to regions outside the "normal" excitation volume. However, resolution of the ground characteristics outside of this is extremely difficult.

Inversion Analyses

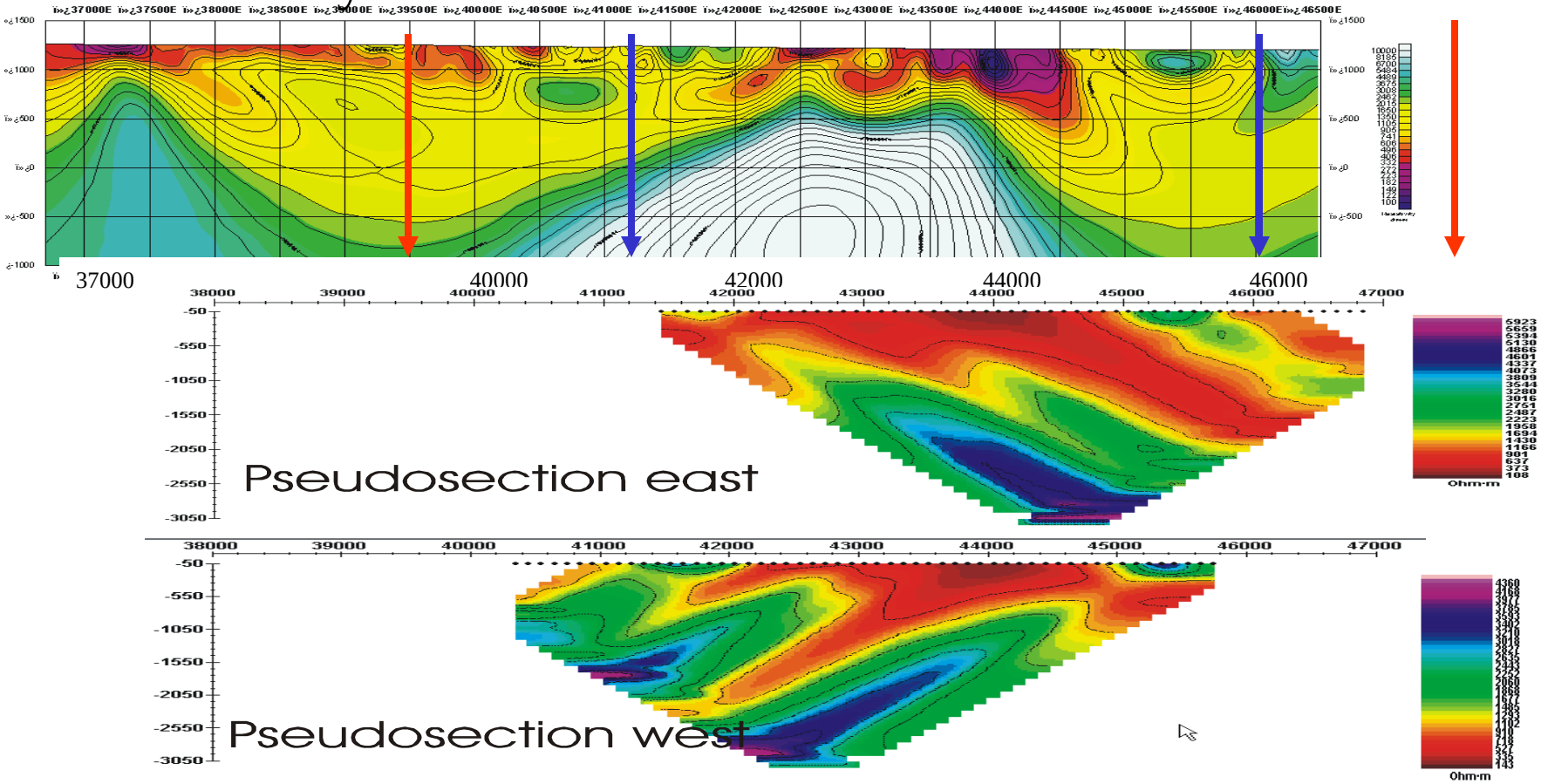
DC Resistivity Inversion – Line L-69343N to 70143N



Questions: The resistivity inversions are critical. This is because the resistivity shows the current distribution and thus where the polarizability can be detected. The inversions are generally 2D in nature, in the sense that they have some consistency from L69343 (bottom) to L70143(top). However, the near surface features are only approximately similar and as we can see later, they dominate the response. The consistency of the western plug and the eastern shallow resistive zone are perplexing in that these regions are poorly sampled. Also, the ability to resolve a resistive plug in the middle below conducting material is also questioned at this stage

Data Summary

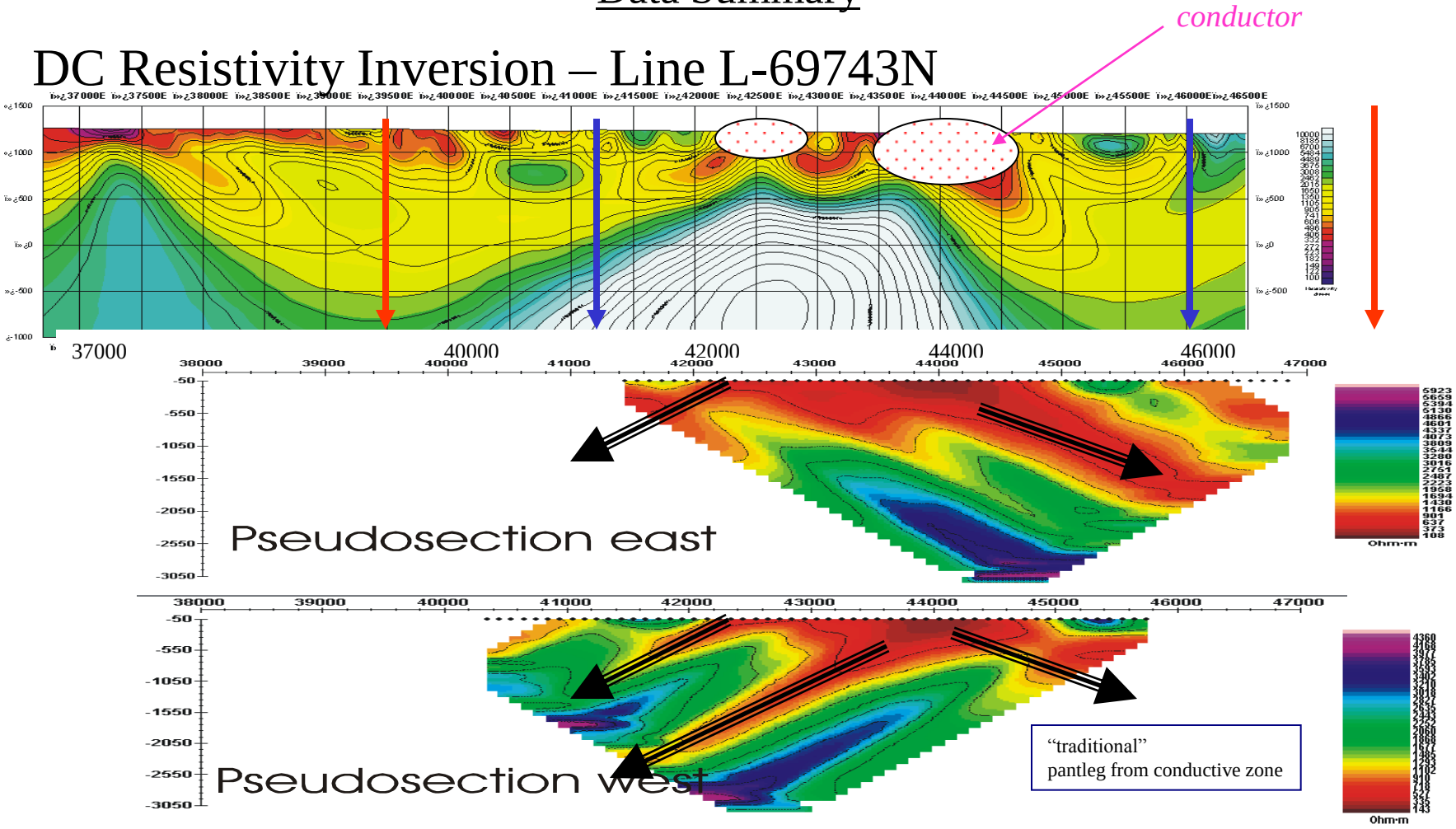
DC Resistivity Inversion – Line L-69743N



Questions:The top figure is the inversion delivered for L-69743. Note: Violet is conductive and while is resistive. The middle figure is the resistivity pseudo-section for the current laid to the east of the potential electrodes and the bottom figure is the same pseudo-section for the current laid to the west of the potential electrodes. These bottom (2) regions would normally be considered the volumes of excitation and the regions which are resolvable. Note: for the bottom figures violet is very resistive as is dark-blue, conducting is red. Note: the inversions are w.r.t. GPS elevation while the pseudo-sections are with respect to z=0.

Data Summary

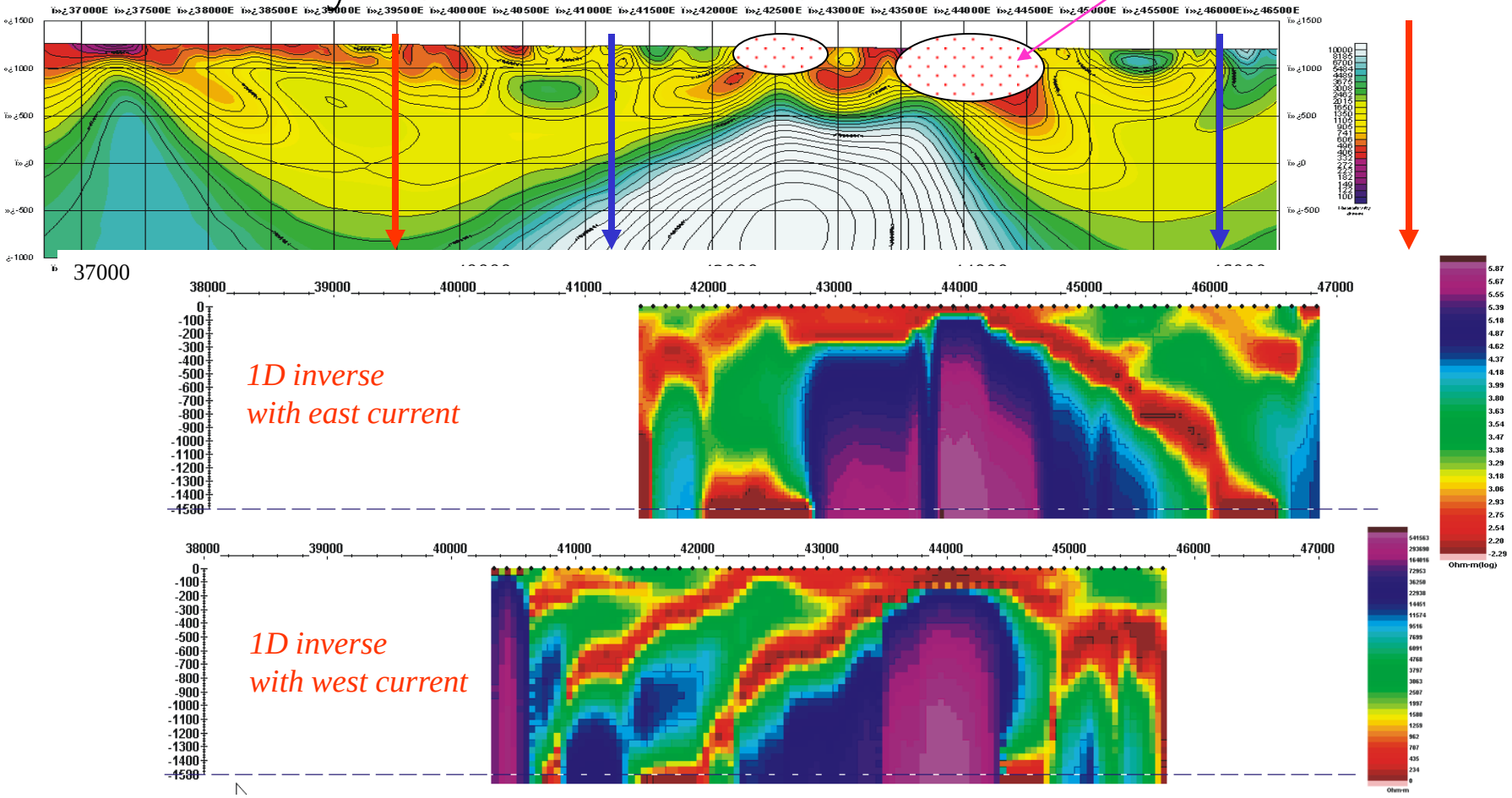
DC Resistivity Inversion – Line L-69743N



Questions:The pseudo-sections which are merely a means of displaying all the data show the mail conductive zone centered at 44000E. However, the remainder of the data is dominated by the traditional pantlegs coming from such a zone. The resistive zone below the conductor is a normal offset to the pantlegs. Also, of note is the pantleg at 42000E particularly on the west pseudosection. Here it will be noted that the pantleg ends at a depth of 1050m. This would seem to indicate a short strike object. Also, note the pantleg at 44000E on the west pseudosection. It also ends before the maximum depth.

1D versus 2D Inversions

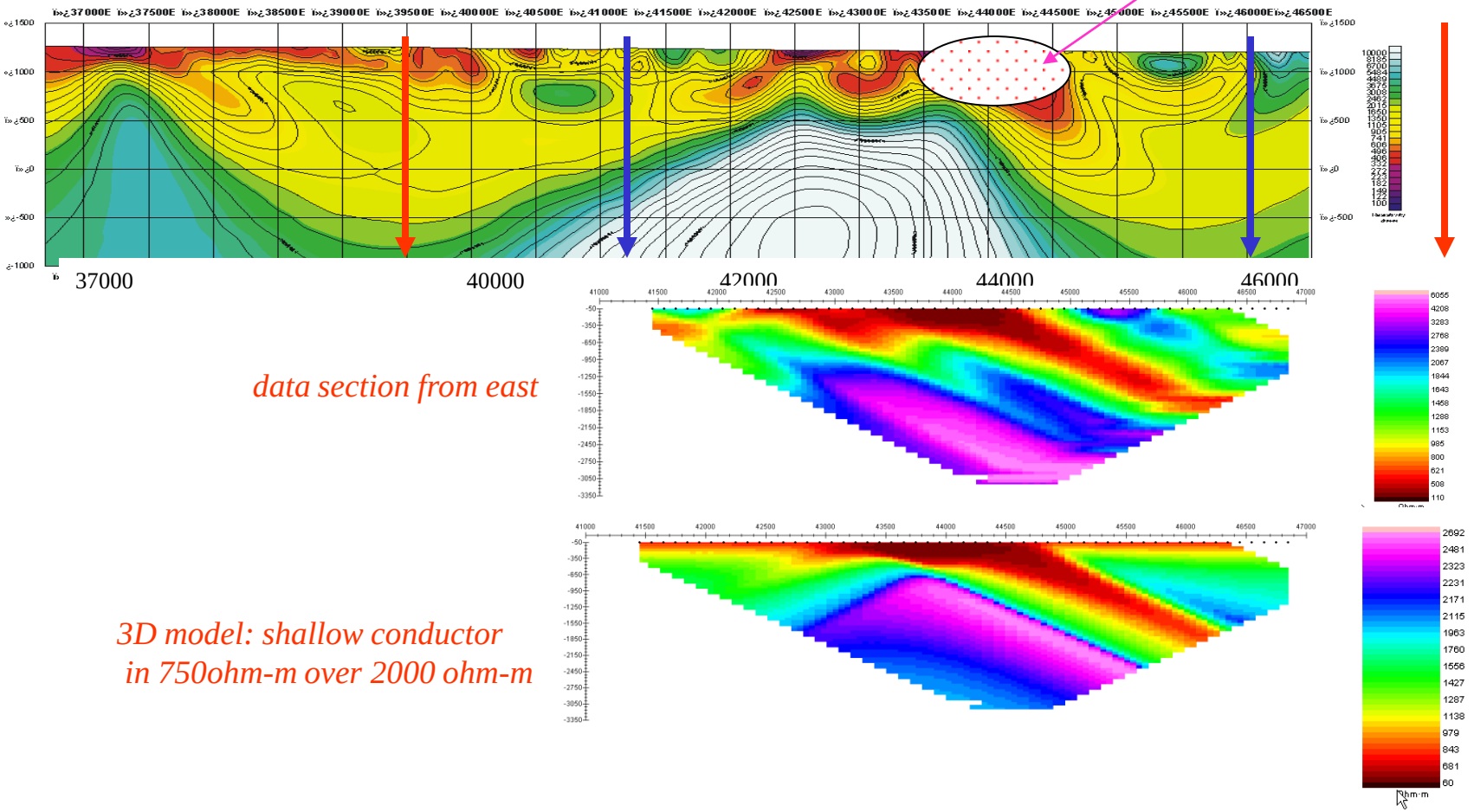
DC Resistivity Inversion – Line L-69743N



Questions:The 1D inversions indicate much of the same character which is surprising. Also, of particular note, is the determination of the resistive plug centered at 44000E. The 1D inversion indicates this plug to be considerably shallower. Given the relative uniformity of the short offset data over this region, there is no reason to expect the depth to this plug to be inaccurately determined from the 1D inversion.

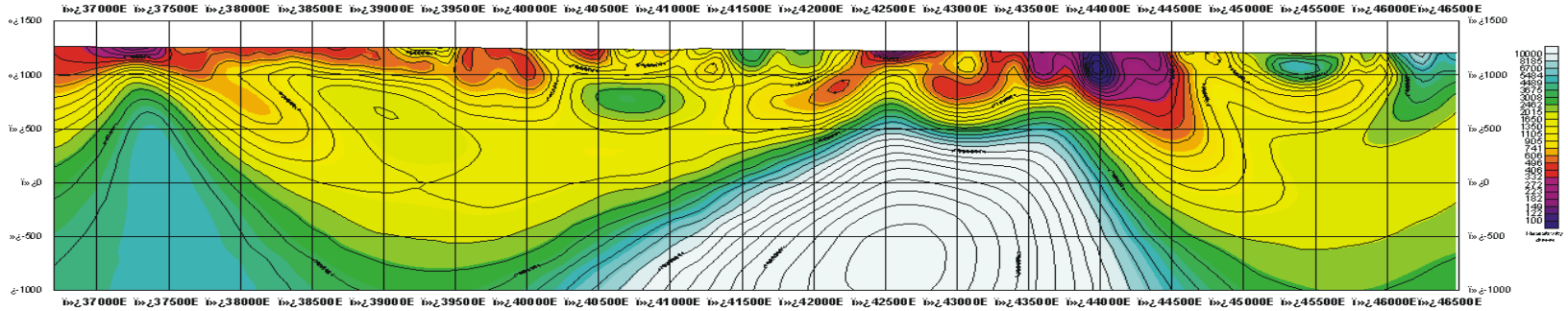
3D Modelling

Line L-69743N



Questions:Here we have modeled only the shallow conductor dipping slightly to the east at 44000E and placed it in a 2-layer medium. The effective apparent resistivity very closely matches as do the pantlegs and the resistor above and below the pantleg. The resistivity of the zone below the pantleg is a function of the basement resistivity. A very similar feature effect is seen for the current to the west.

summary



Comments: April 10, 2006

The deep resistive intrusive centered at 43000E has a minimal effect on the models. The models are dominated by the shallow conductors at 44000E and 42500E. The shallow resistor at 45500E was also modeled at it also has significant effect as the resistor at 41500E must also.

The east extent of the main conducting surficial structure appears much too deep from modeling and appears to be a remnant of the pantleg in the inversion. This seems also true of the conductor below 43000E and the conducting zone below 42000E.

Note: It has been somewhat more complex to investigate this data than expected due to the possibility that the inversion is actually meant to extend to 37000E despite the lack of data to the west. Also, the westerly extent of the central plug was also investigated from the inverse perspective.

The data that might be sensitive to the central resistive plug is patchy and rather noisy compared to the modeled response of such a feature.

Recommendations

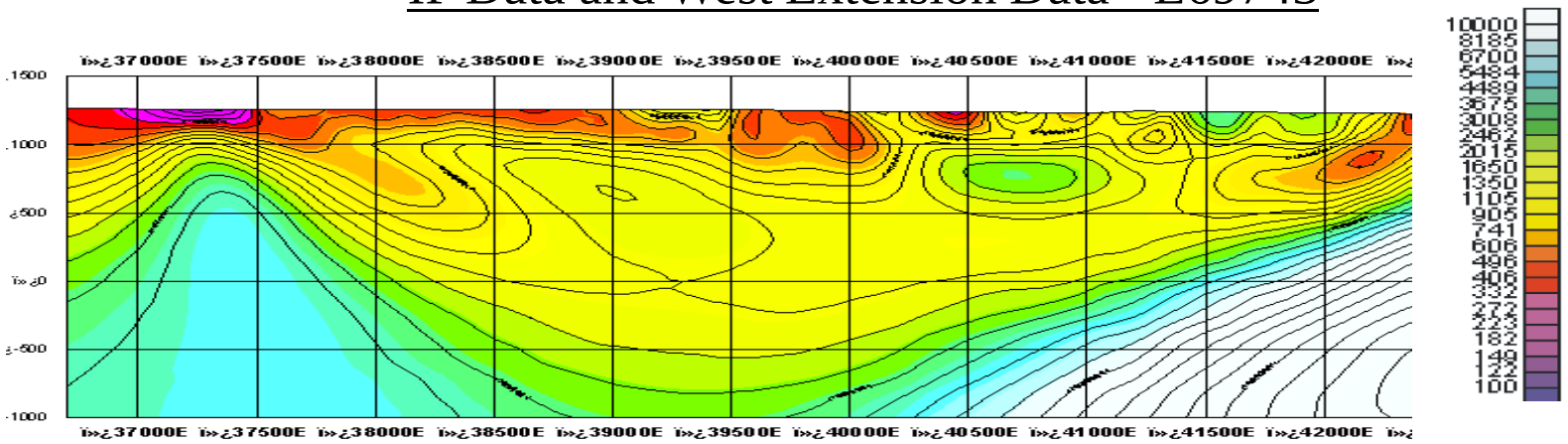
Recommendations *: April 10, 2006*

The modelling analyses of Line 69743 is not quite complete and should possibly be continued for another day.

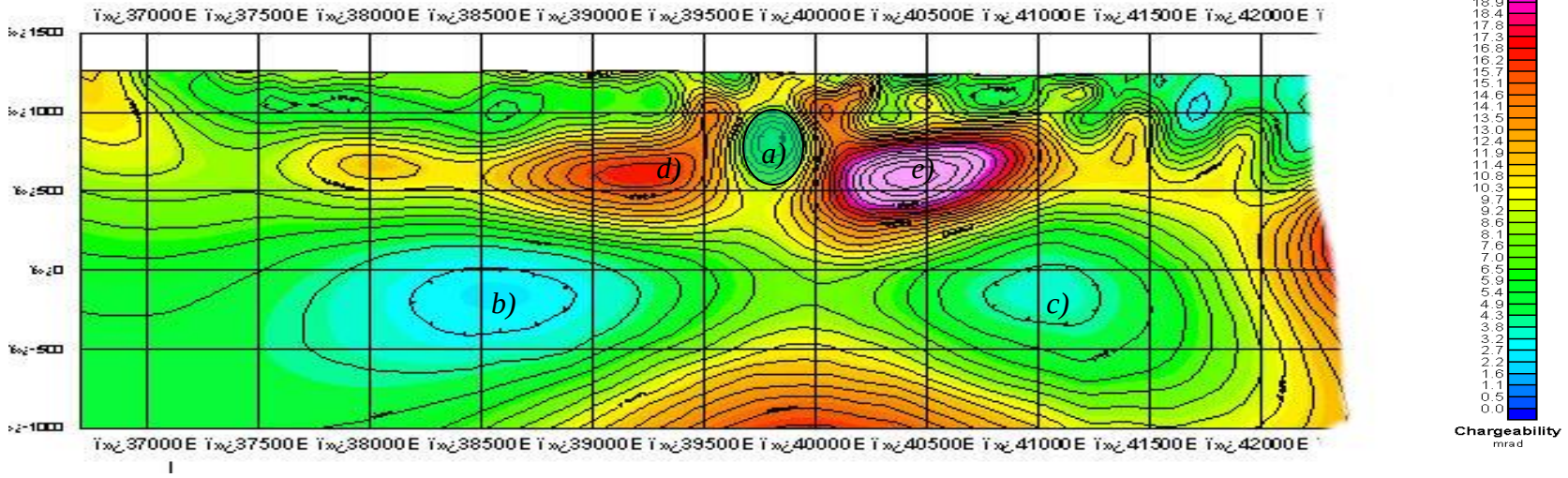
Analyses of other lines will be more rapid and may lead to more comprehensive results.

The modelling has still not been done on the IP effect.

IP Data and West Extension Data - L69743



Resistivity Inversion (Ohm-m)



IP Inversion??? (mrad ???)

Comments:

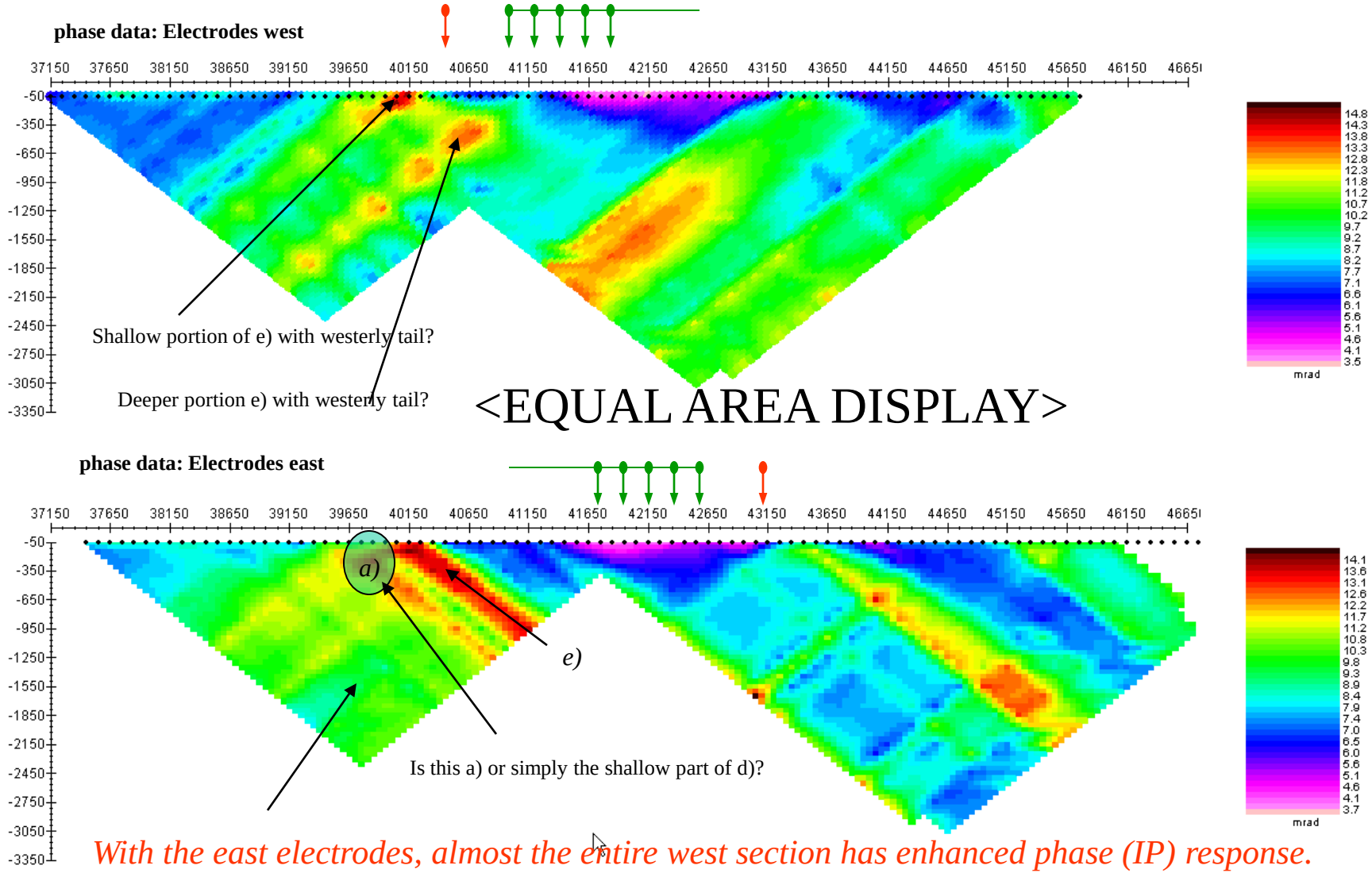
1) mrad are not a unit of chargeability (IP effects) but rather units of electric field (ie phase)

2) Target of interest at 39750E shows only a background response? (a)

3) Lower targets (how are they determined)? b) and c)

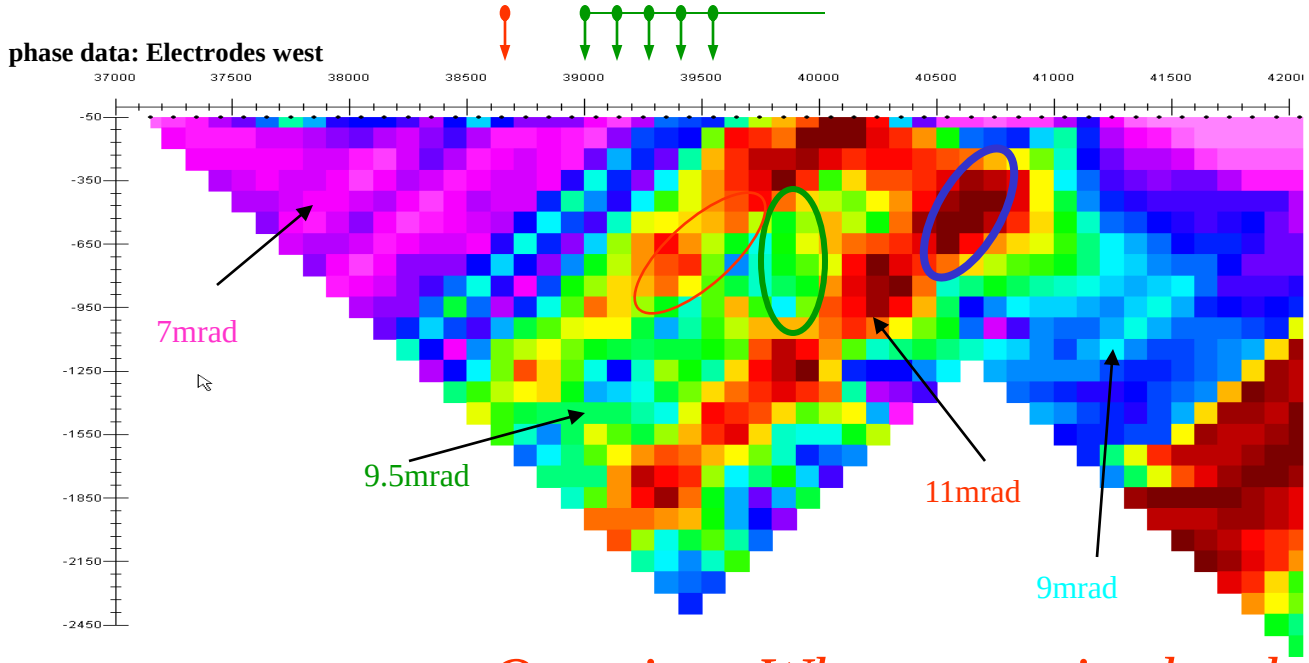
4) High IP targets d) and e) : d) has an association with a shallow conductor and e) has an association with a shallow conductor and a deeper resistor.

IP Data and West Extension Data - L69743



With the east electrodes, almost the entire west section has enhanced phase (IP) response.
The phase enhancement on the west extension by the "supposed" targets is minimal.
Note also, that for thewest electodes that the tails break-up indicating relatively weak response compared to background or a target off-line.

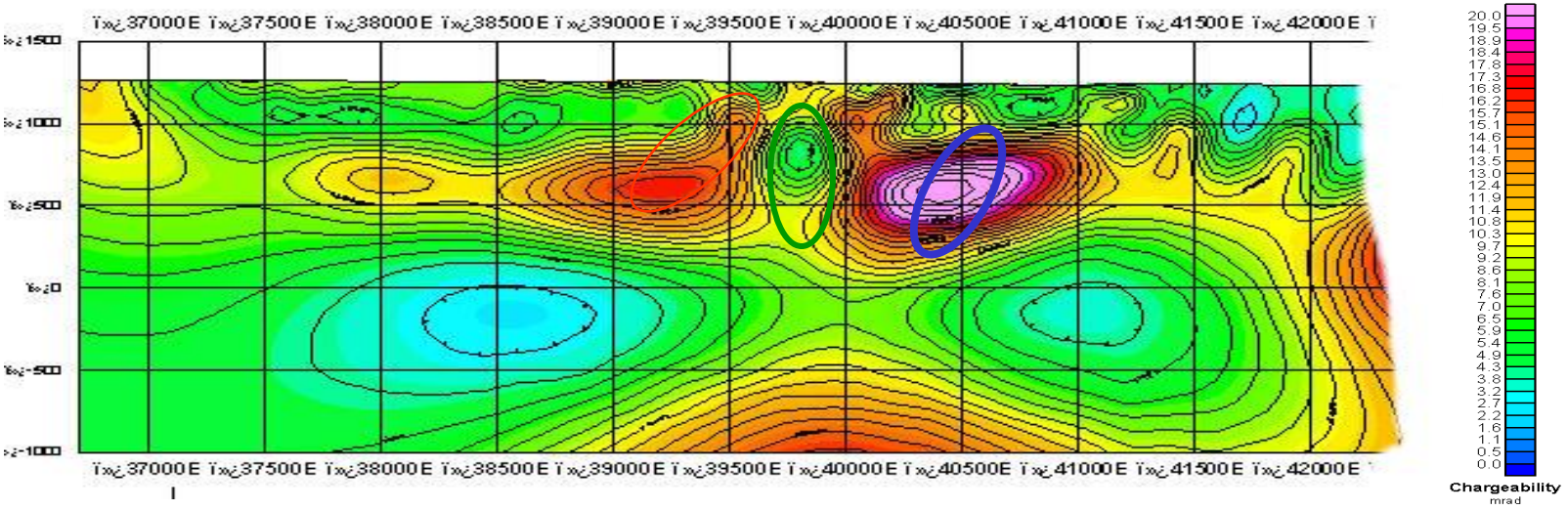
IP Data and West Extension Data - L69743

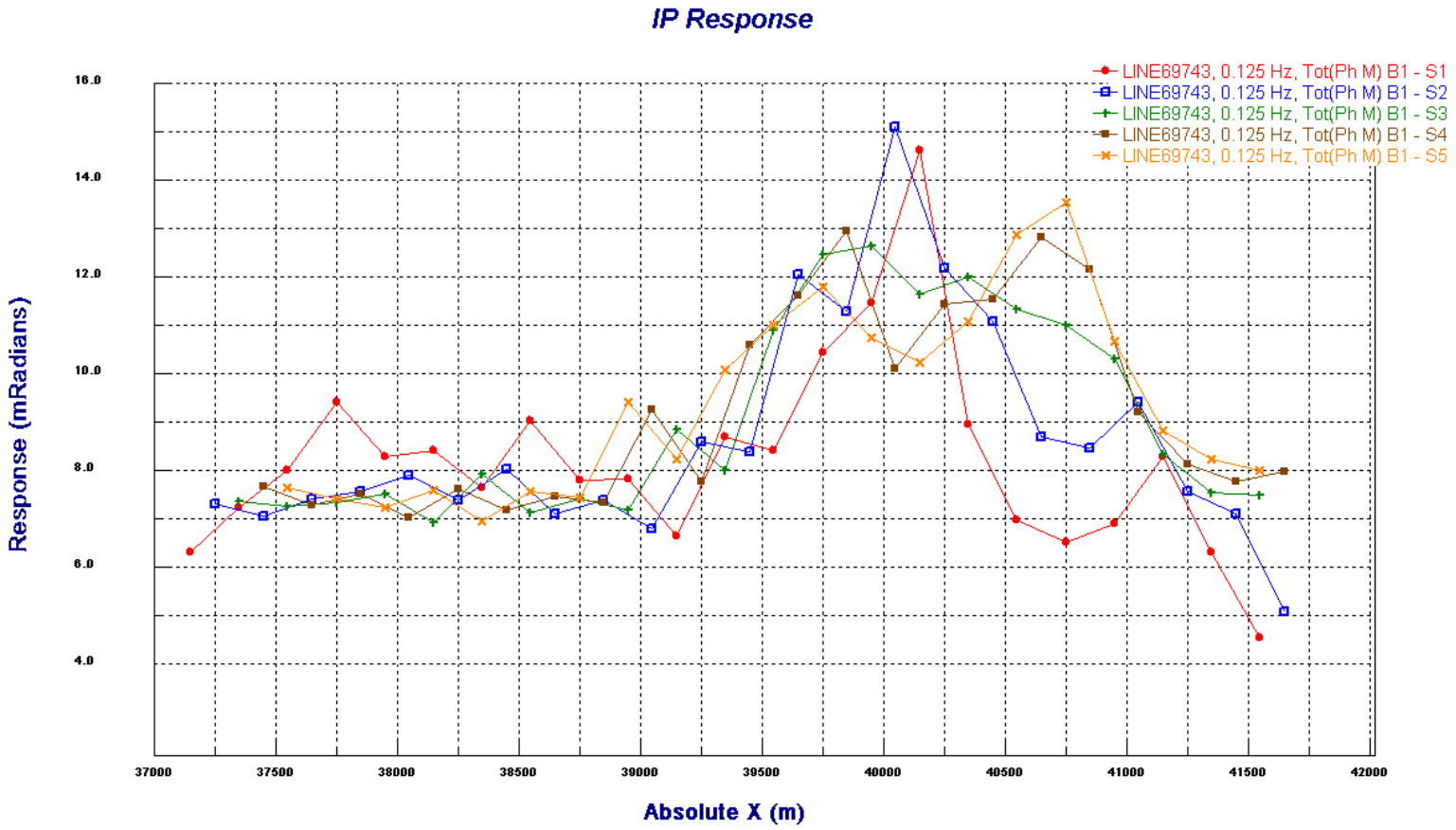


- background (average)
- resistor – pg 12
- tail of surface conductor at 40100. (?)

Phase

Question: What are noise levels?

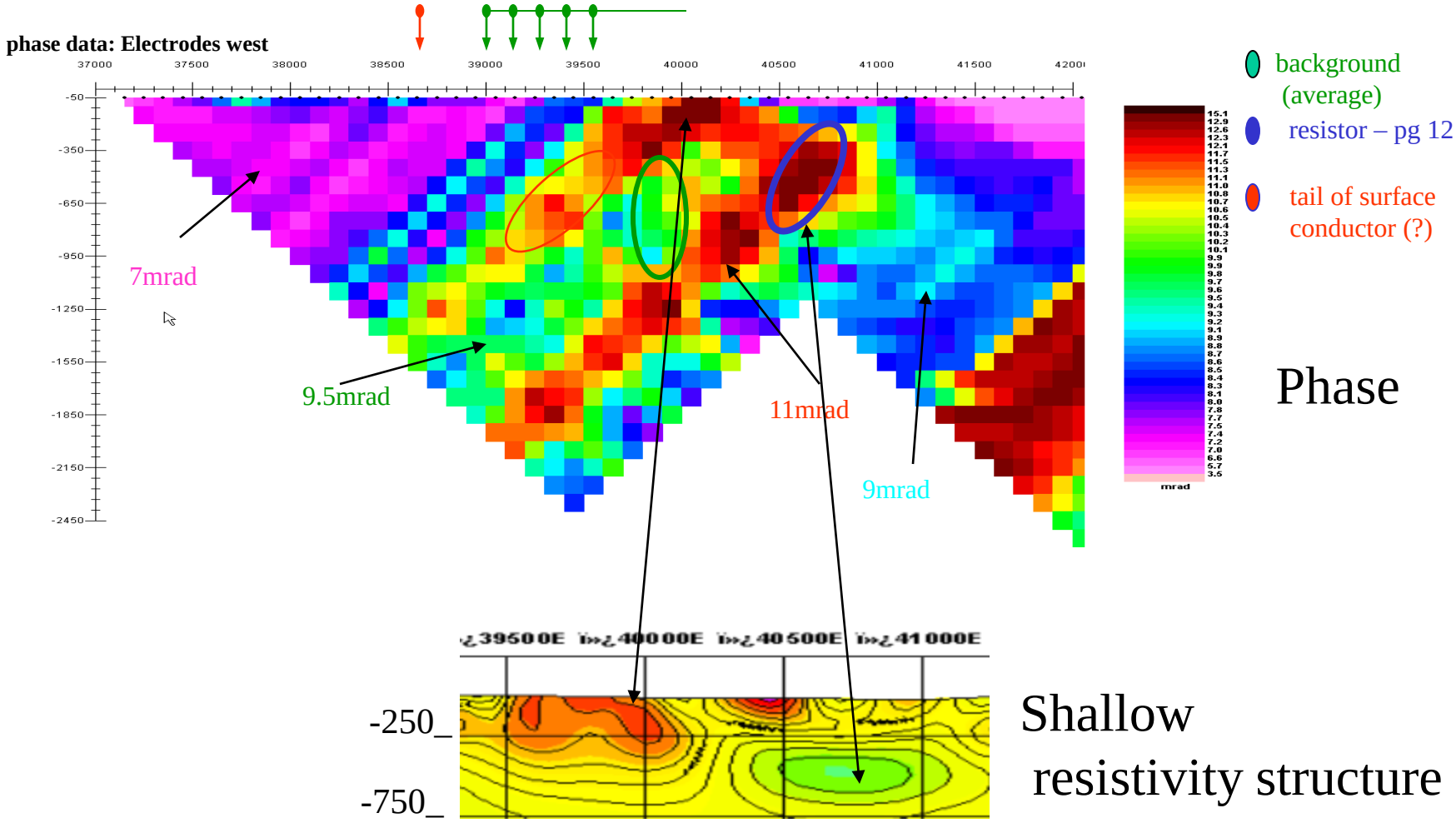




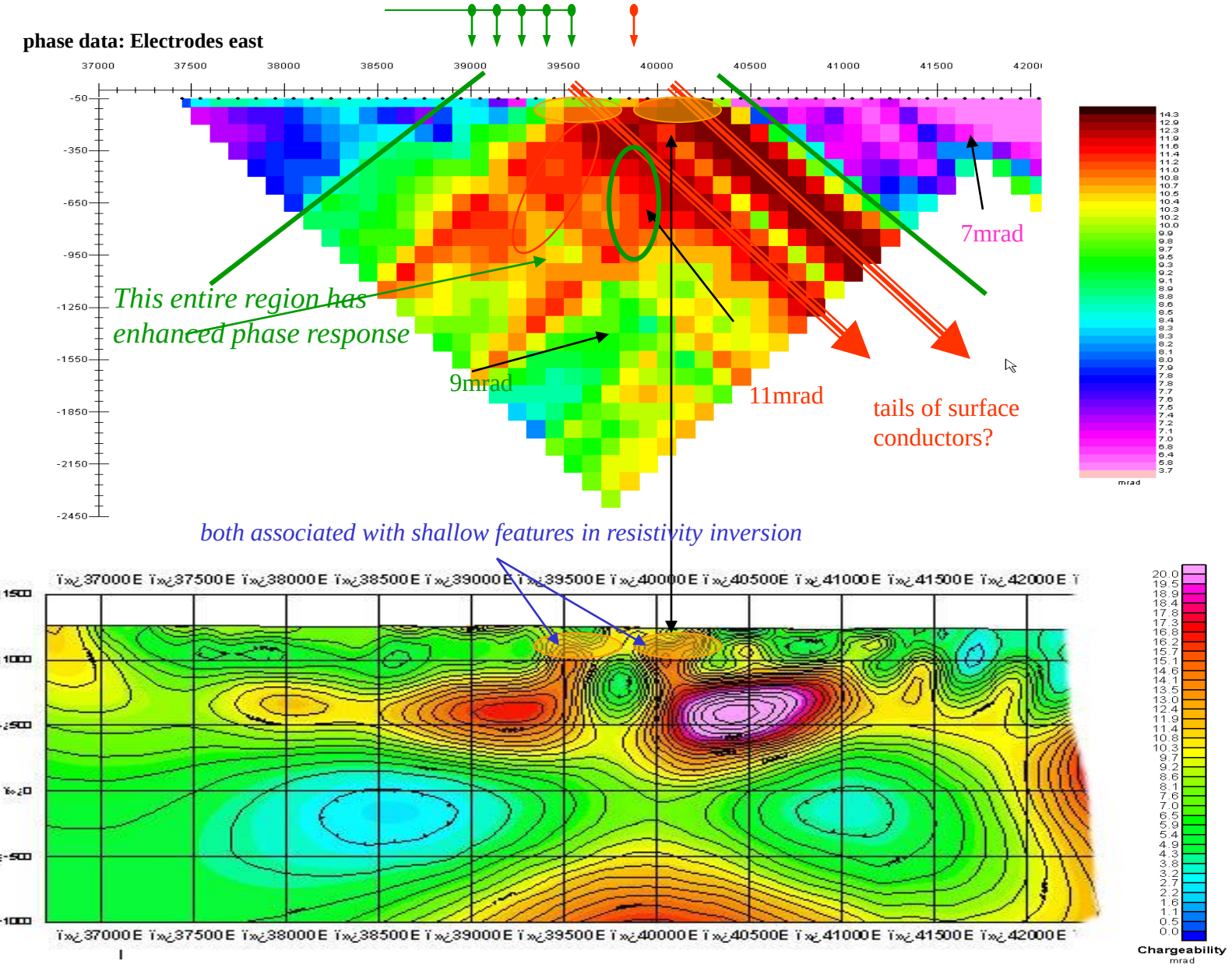
West current electrodes – N=1,5

With some degree of effort, one can imagine a shallow target at 40100 and deeper target at 40750. Interesting to note is that 40750 is the inverted position of the resistor and not the inverted position of the most chargeable body.

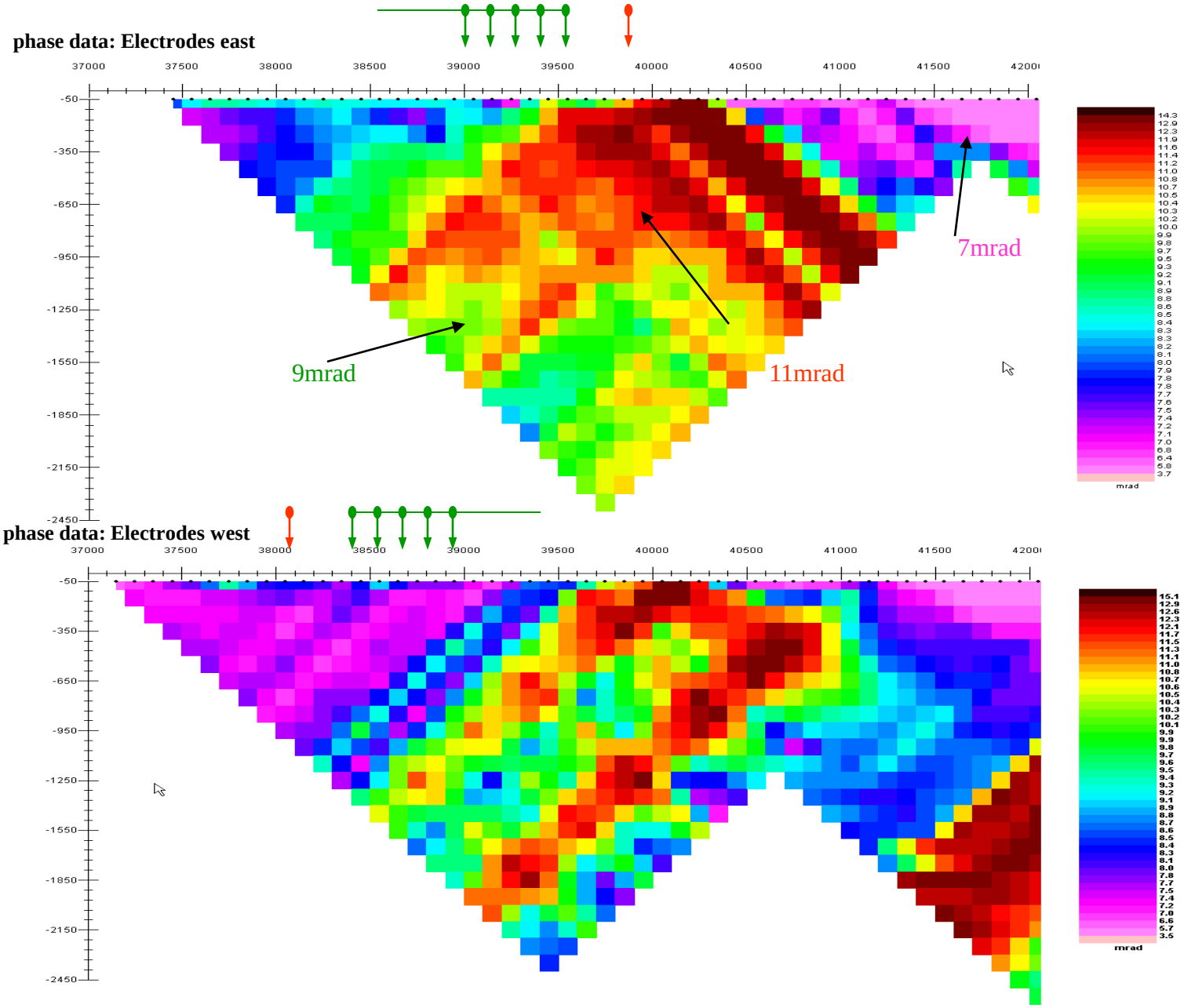
IP Data and West Extension Data - L69743



IP Data and West Extension Data - L69743

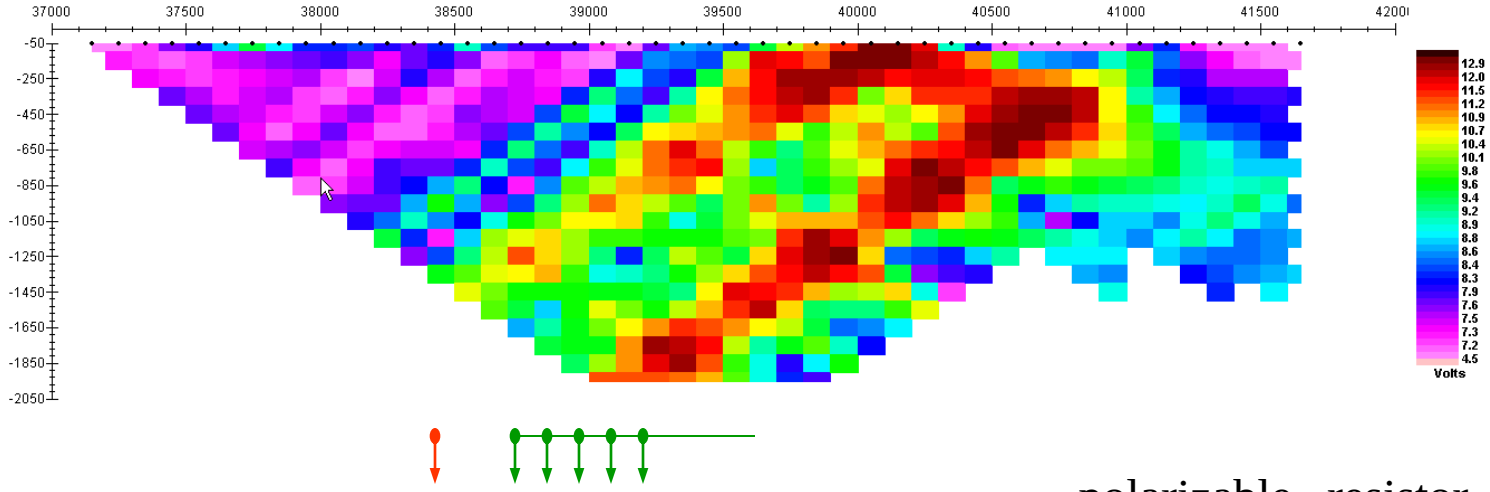


IP Data and West Extension Data - L69743



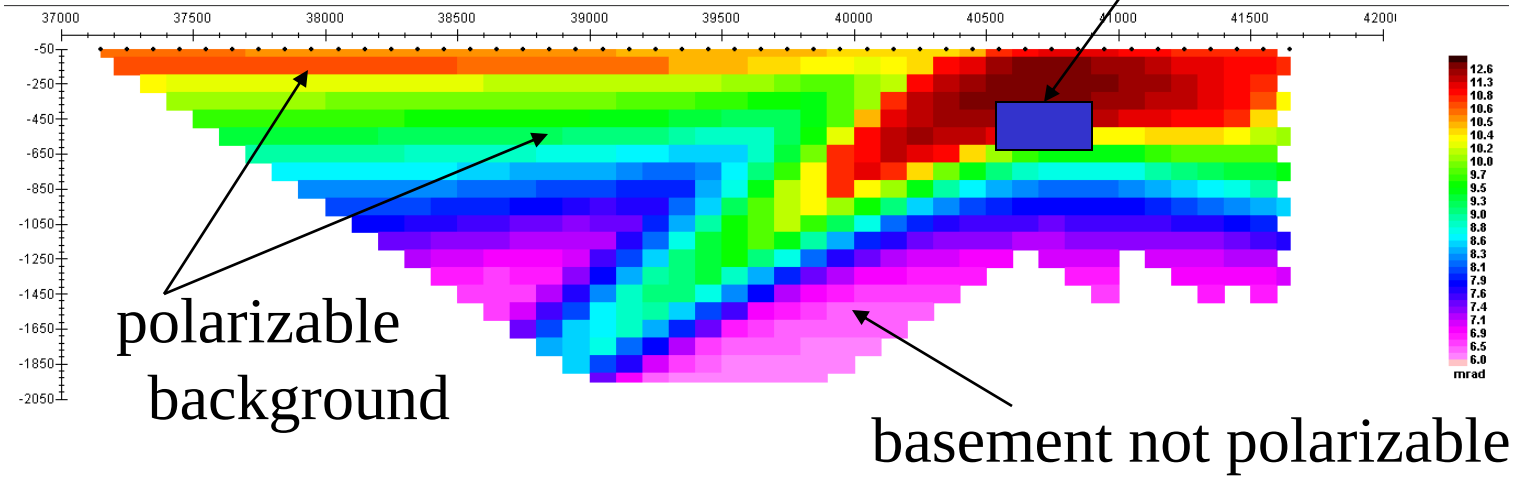
IP Data and West Extension Data - L69743

phase data: Electrodes west



simulated phase data: Resistor at 40750 – (see page 12)

polarizable resistor
S- 800m, W – 500m, T – 300m



polarizable background

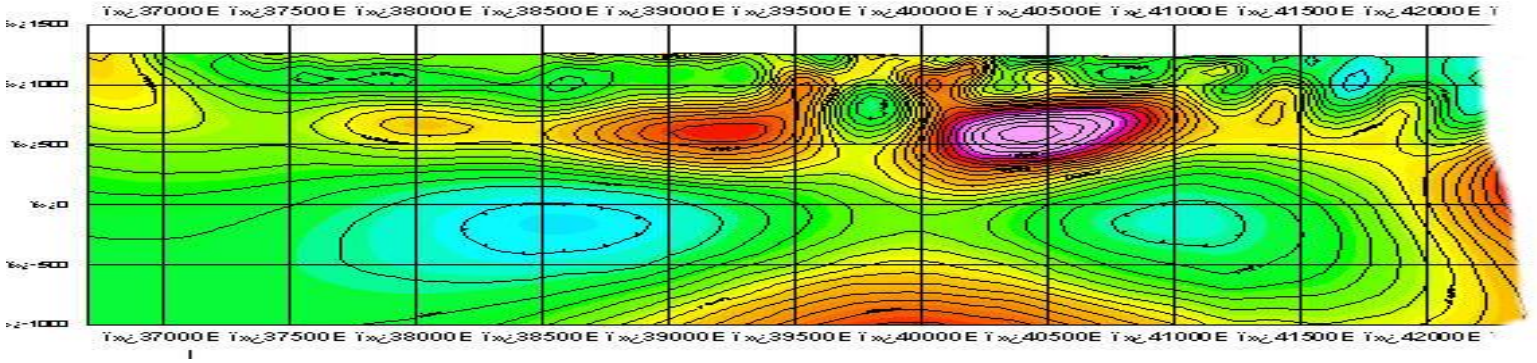
basement not polarizable

This model, however, does not fit any aspect of the east electrodes.

IP Data and West Extension Data - L69743

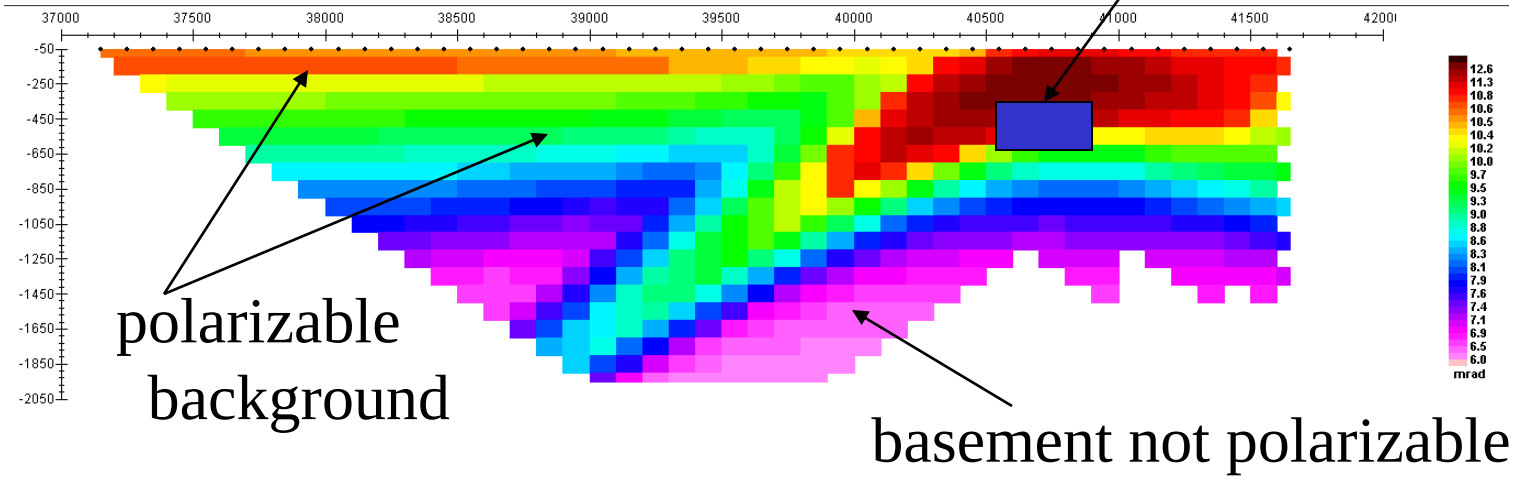
d=250

d=750



simulated phase data: Resistor at 40750 – (see page 12)

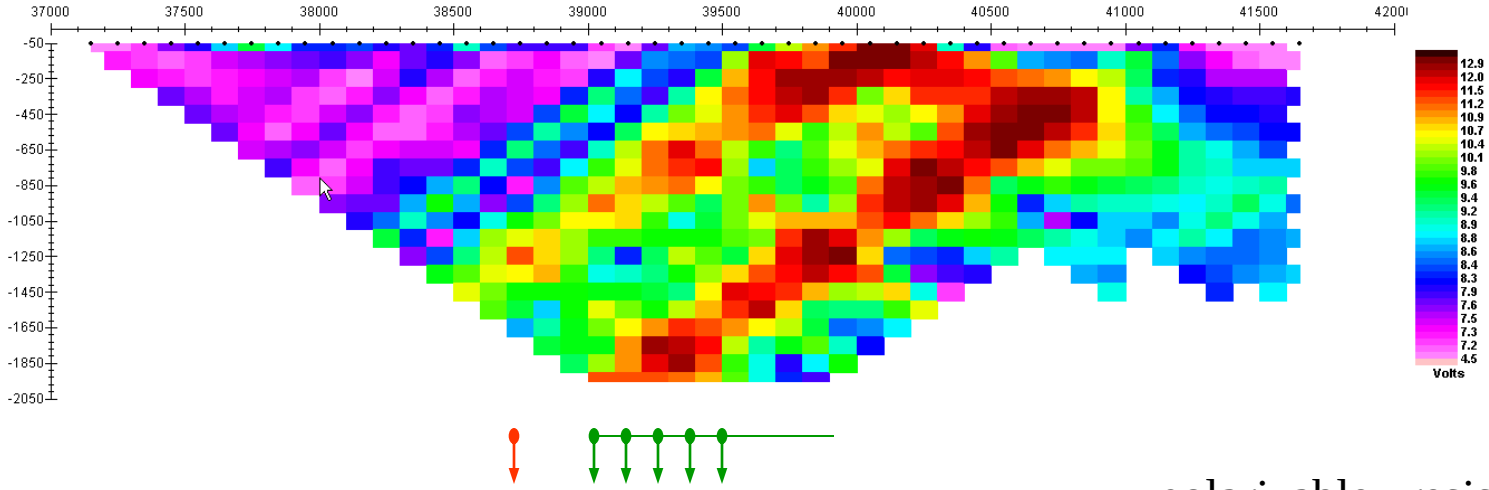
polarizable resistor
S- 800m, W – 500m, T – 300m



phase data: Electrodes west

IP Data and West Extension Data - L69743

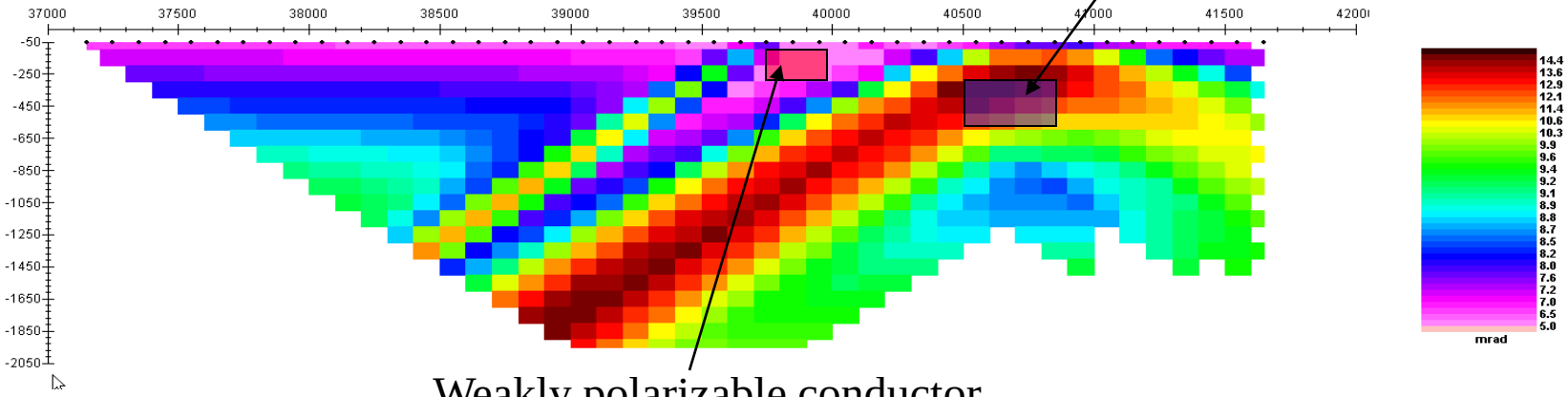
phase data: Electrodes west



simulated phase data: Resistor at 40750 and conductor at 39750 (see page 12)

polarizable resistor

S- 800m, W – 500m, T – 300m



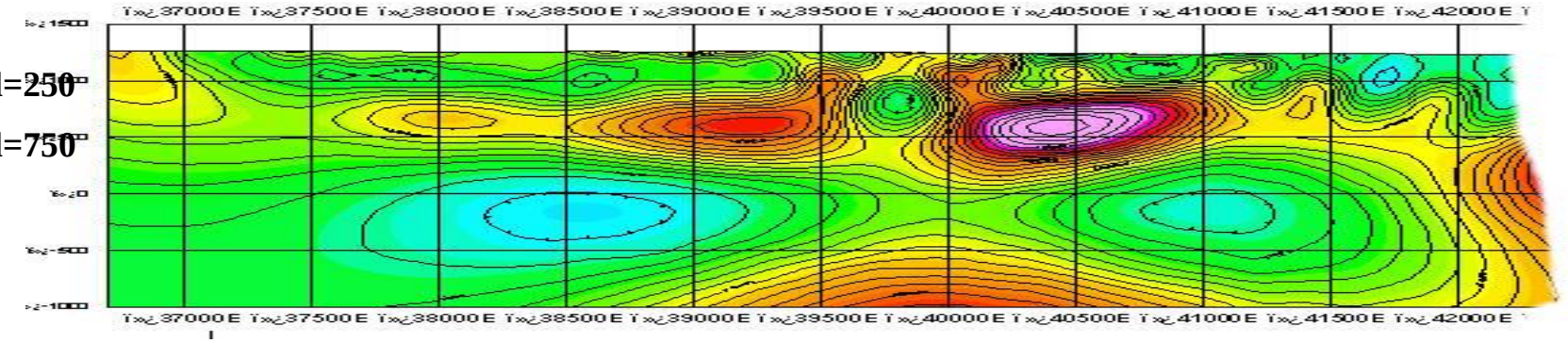
Weakly polarizable conductor

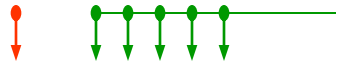
S- 100m, W – 200m, T – 200m

data would indicate off-line feature

phase data: Electrodes west

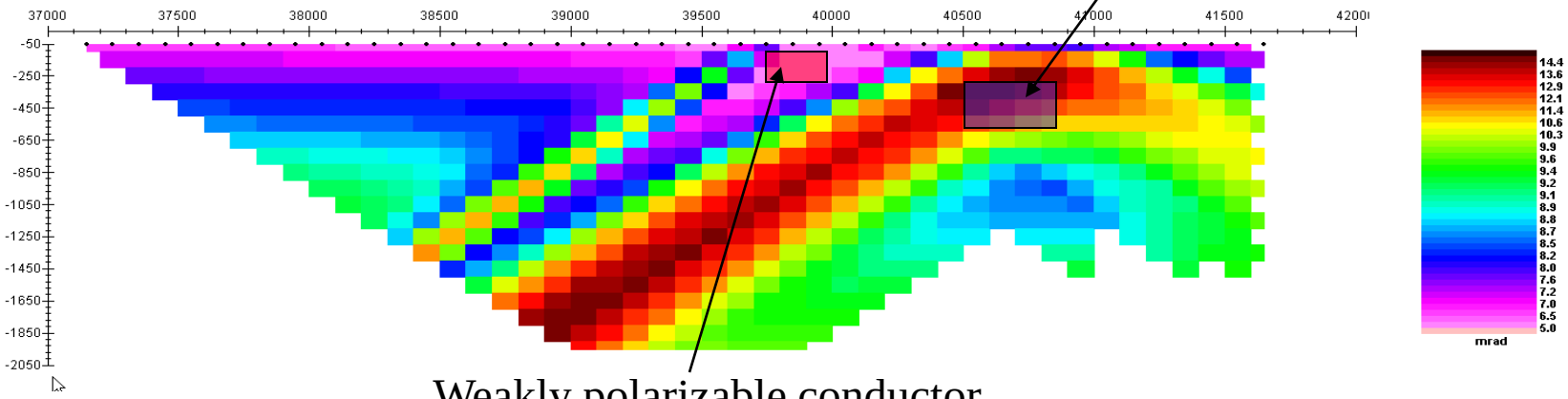
IP Data and West Extension Data - L69743





simulated phase data: Resistor at 40750 and conductor at 39750 (see page 12)

polarizable resistor
S- 800m, W – 500m, T – 300m



Weakly polarizable conductor
S- 100m, W – 200m, T – 200m
data would indicate off-line feature

phase data: Electrodes west