TECHNISCHE UNIVERSITÄT WIEN
Vienna University of Technology

Applied Geophysics
Angewandte Geophysik

Electrical Resistivity Tomography

Messaufbau

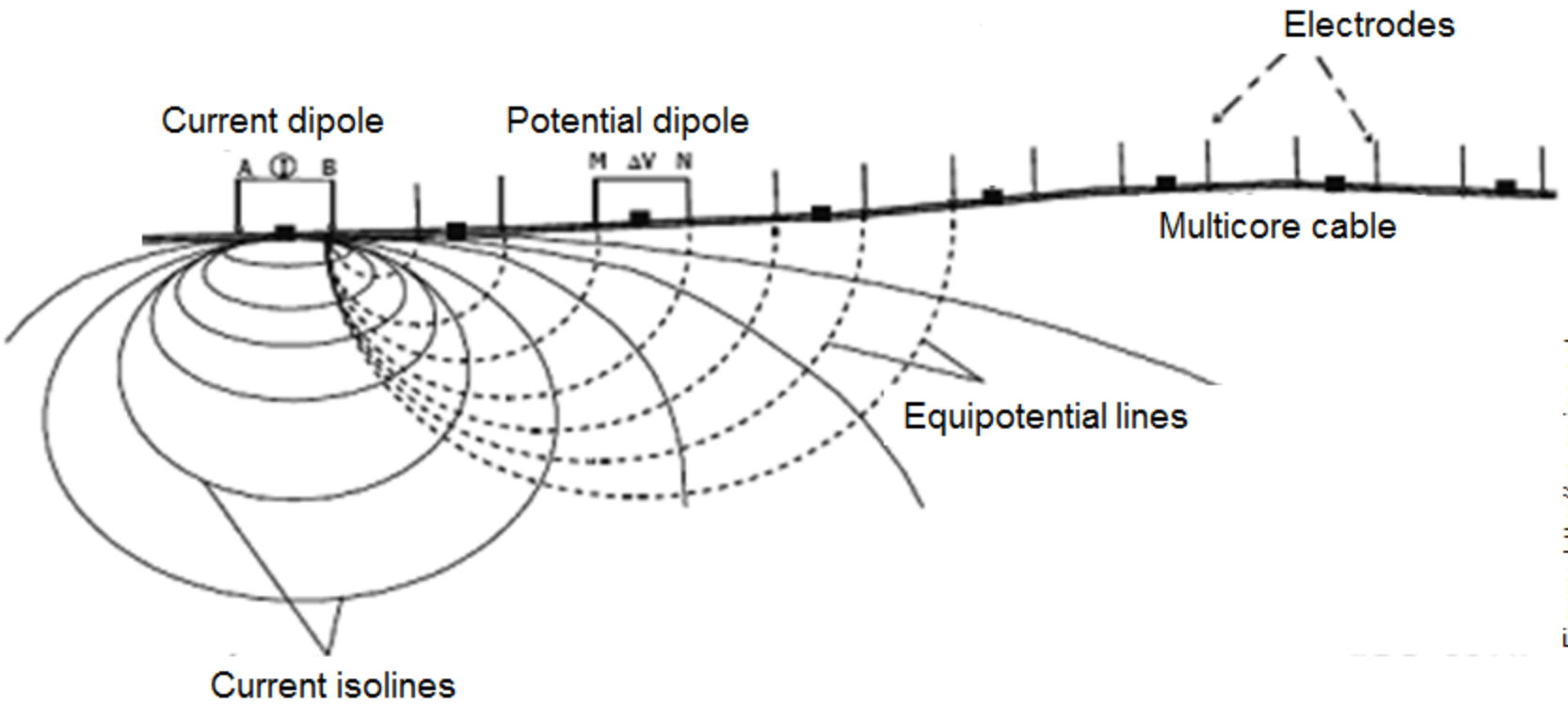


Figure: http://www.igc.cat

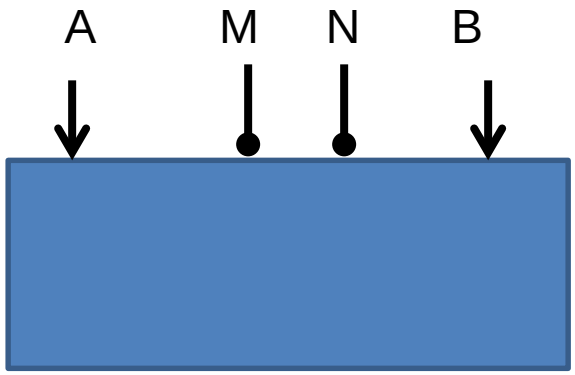
Spezifischer elektrischer Widerstand

$$\rho = k\frac{V}{I}$$

ρ – spezifischer elektrischer Widerstand
V – Spannung
I – Strom

k – geometrische Faktor

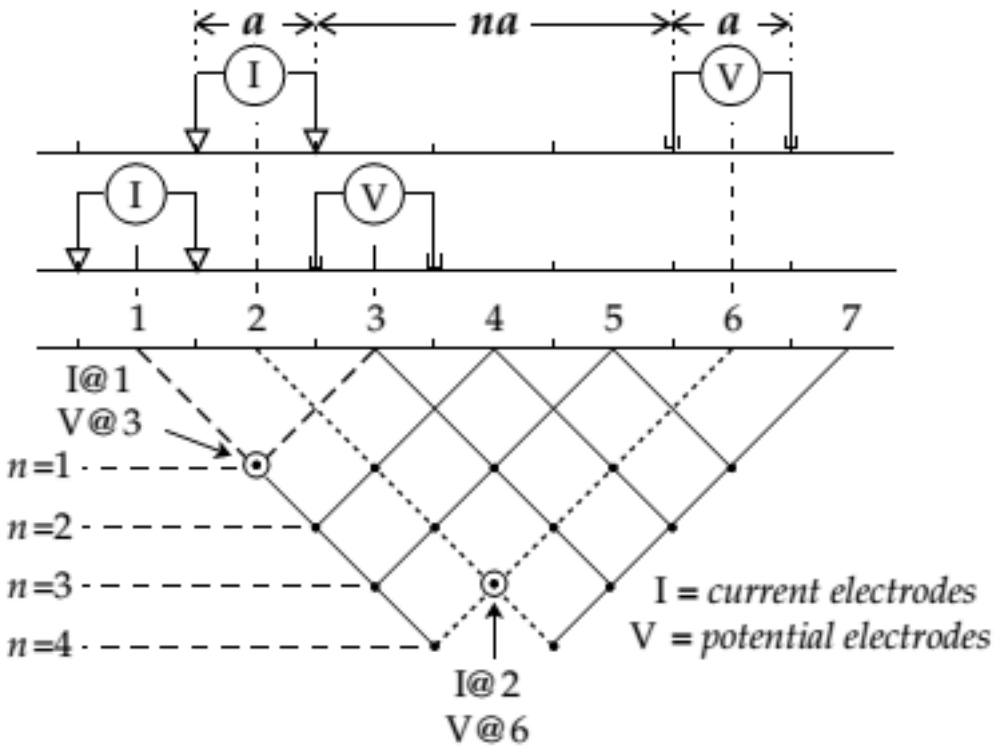
$$k = 2 \cdot \pi \cdot \left[\frac{1}{AM} - \frac{1}{AN} - \frac{1}{BM} + \frac{1}{BN} \right]^{-1}$$



Pseudosection

$$x = \frac{l\left(\frac{A+B}{2} + \frac{M+N}{2}\right)}{2}$$

$$z = -\left(x - \frac{l(A+B)}{2}\right)$$



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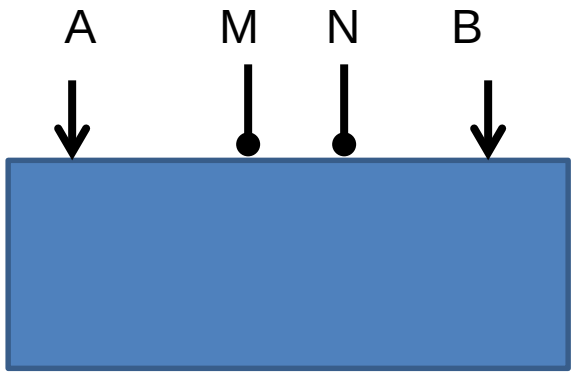
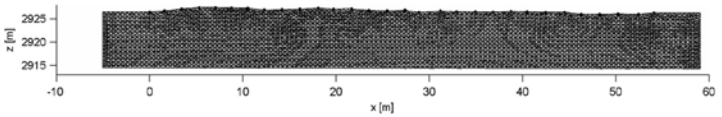
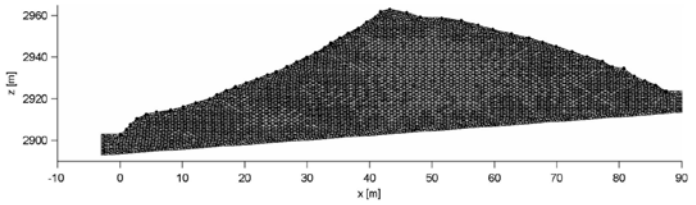


ρ_a - Scheinbarer spezifischer elektrischer Widerstand

$$\rho_a = k\frac{V}{I}$$





Inversion

```
****FILES***              ! Header line, do not modify!
./grids/108_1m.elm        ! Element file and its path
./grids/108_1m.elc        ! File containing electrode positions
./crt/nn_limberg_p3.crt   ! CRT file with the measurements
./inv/p3_version2         ! Destination file of the inversion results
F                         ! F: no time-lapse inversion, followed by 3 empty lines, do not modify!


***PARAMETERS***          ! Header line, do not modify!
0                         ! Default value do not modify!
0                         ! Default value
1                         ! Horizontal smoothing, in x direction, for layered model
1                         ! Vertical smoothing, in z direction, for sharp vertical changes
25                        ! Maximal number of iteration
T                         ! Logical switch T: DC resistivity, F: Rho and IP
F                         ! Robust inversion T/F
F                         ! Final phase improvement T/F
3                         !!!!Error parameter!!!! Relative error in resistance, given in %
0.001                     !!!!Error parameter!!!! Absolute error in resistance, given in Ohm
0                         ! Phase error, do not modify!
0                         ! Phase error, do not modify!
0                         ! Phase error, do not modify!
0                         ! Phase error, do not modify!
F                         ! Logical switch F: no homogeneous start model
1000                      ! Resistivity value of the starting model in Ohm
0                         ! Phase value of the starting model in mrad
F                         ! Logical switch, start inversion of another dataset
1                         ! 1: inversion in 2.5D, 0: inversion in 2D
F                         ! Logical switch F for 2.5D, T for 2D
464                       ! number of num. sink, needed only in 2D
F                         ! Boundary node. In the case of plate electrode
boundary.dat              ! Do not modify!
0                         ! Smooth regularization for regular grids only. Do not modify!
```

CRT

$AB = A * 10000 + B$

$MN = M * 10000 + N$

Anzahl der Zeilen

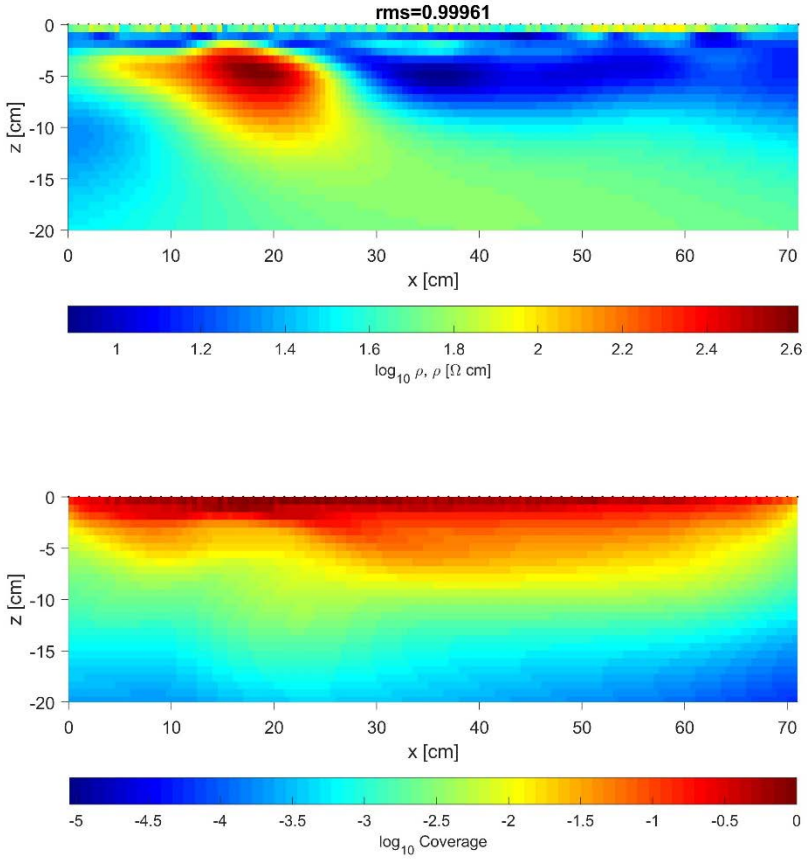
Widerstand

Phase,
Im Fall ERT → DC Inversion
die Werte sollen 0 sein

2312

20001	30004	0.933445	0
20001	40005	0.257485	0
20001	50006	0.105476	0
20001	60007	0.053871	0
20001	70008	0.027549	0
20001	80009	0.014346	0
.			
.			
.			
1020101	1070108	0.404411	0
1030102	1060107	1.183742	0
1030102	1070108	0.685904	0

Inversion Ergebnisse



Inversion vs Pseudosection