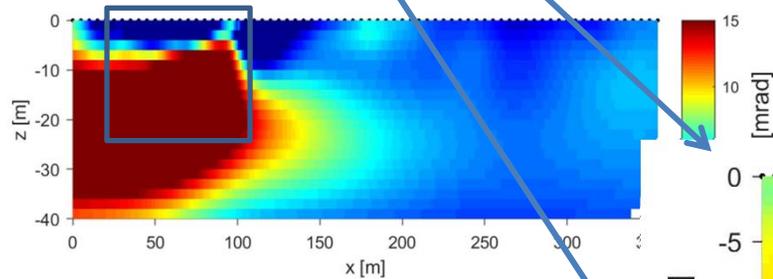
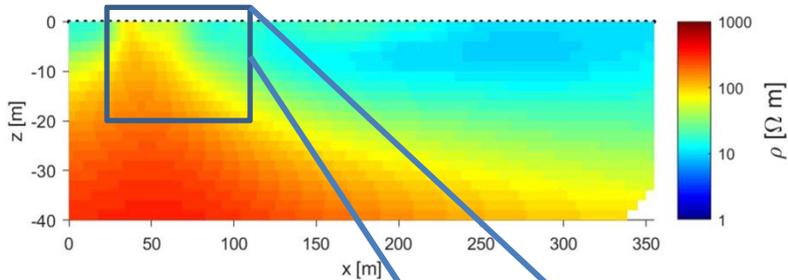
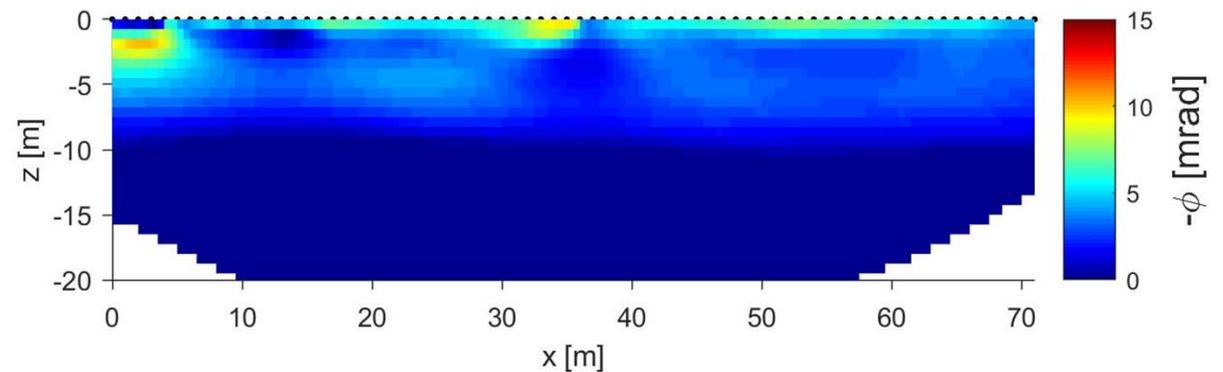
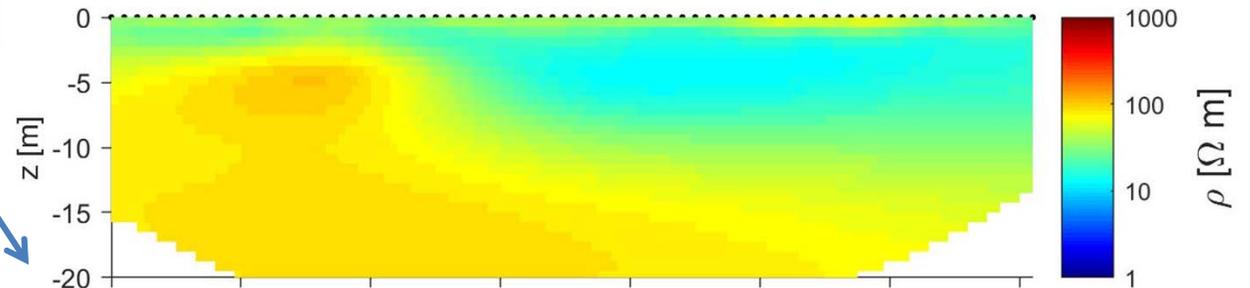


## 5 m separation between electrodes



## 1 m separation between electrodes - Higher spatial resolution



What happened to the IP response?

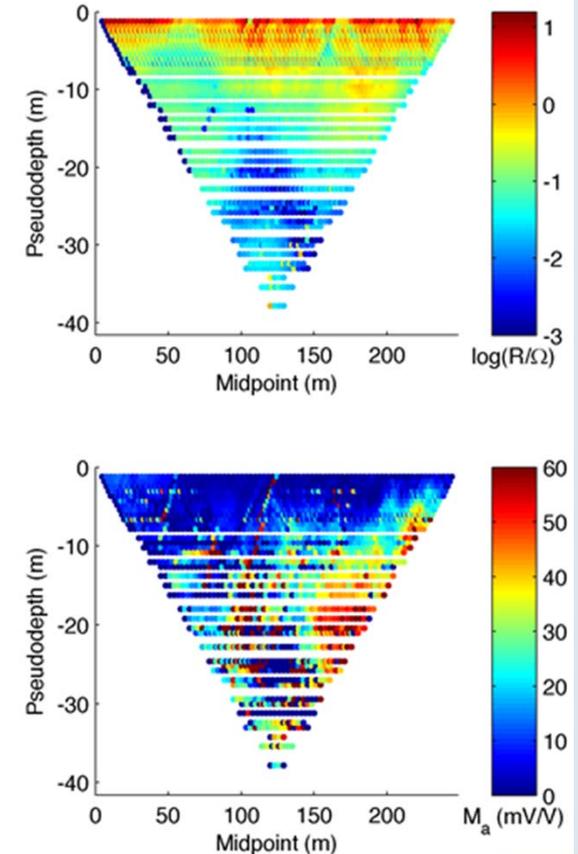
How do you explain the differences observed in the phase-shift images ( $\varphi$ ) for data collected with a separation between electrodes of 1m and 5 m?

Option:

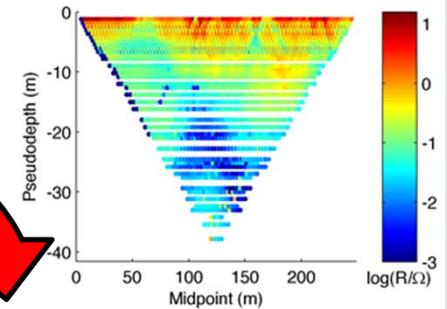
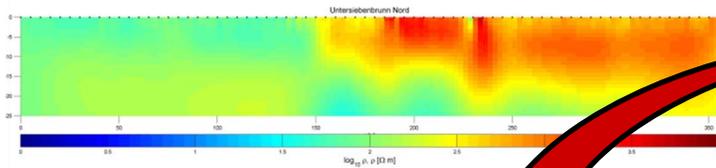
- 1) Plot the pseudosection including the apparent resistivity and the apparent phase (after modification of the routines revised last week)
- 2) Invert the data - note the new grid files:
  - 1) fu\_72e\_1m. elm/elc (for inversions of the data collected with 1 m separation between electrodes)
  - 2) fu\_72e\_5m. elm/elc (for inversions of the data collected with 5 m separation between electrodes)
- 3) Run CRTomo after changing the line 16 from T to F in crtomo.cfg
- 4) Modify the plotting routine

1 Protocol for the ERT section (deadline 11.6.2017) to be submitted to:  
[flores@tuwien.ac.at](mailto:flores@tuwien.ac.at)

Computation of the electrical properties of the subsurface (model) → which can explain the electrical impedance (or voltages, chargeability) measured on the field



## Forward calculation



### Model

2D or 3D distribution of the complex electrical resistivity

### Data

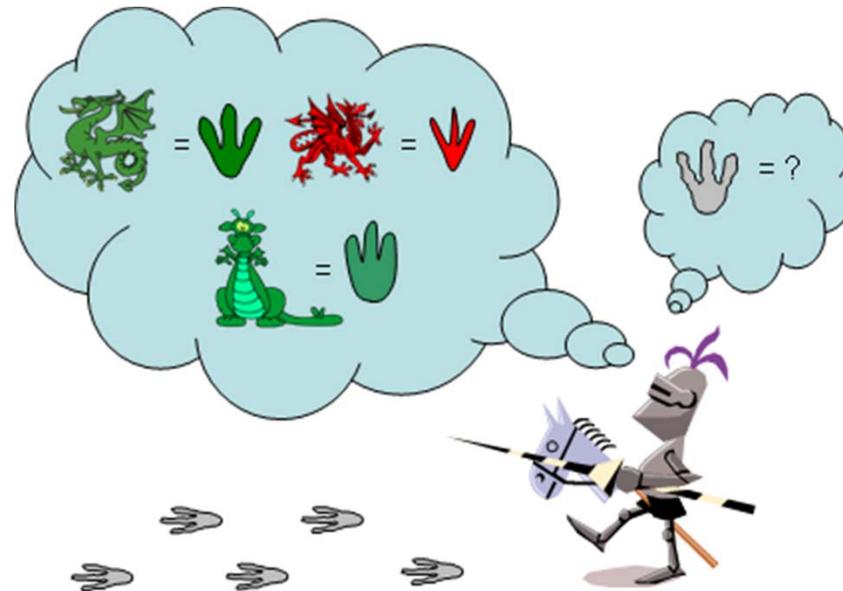
Resistances (voltages, current)  
Electrical Impedances (resistance and phase-shift or chargeability)

## Inversion

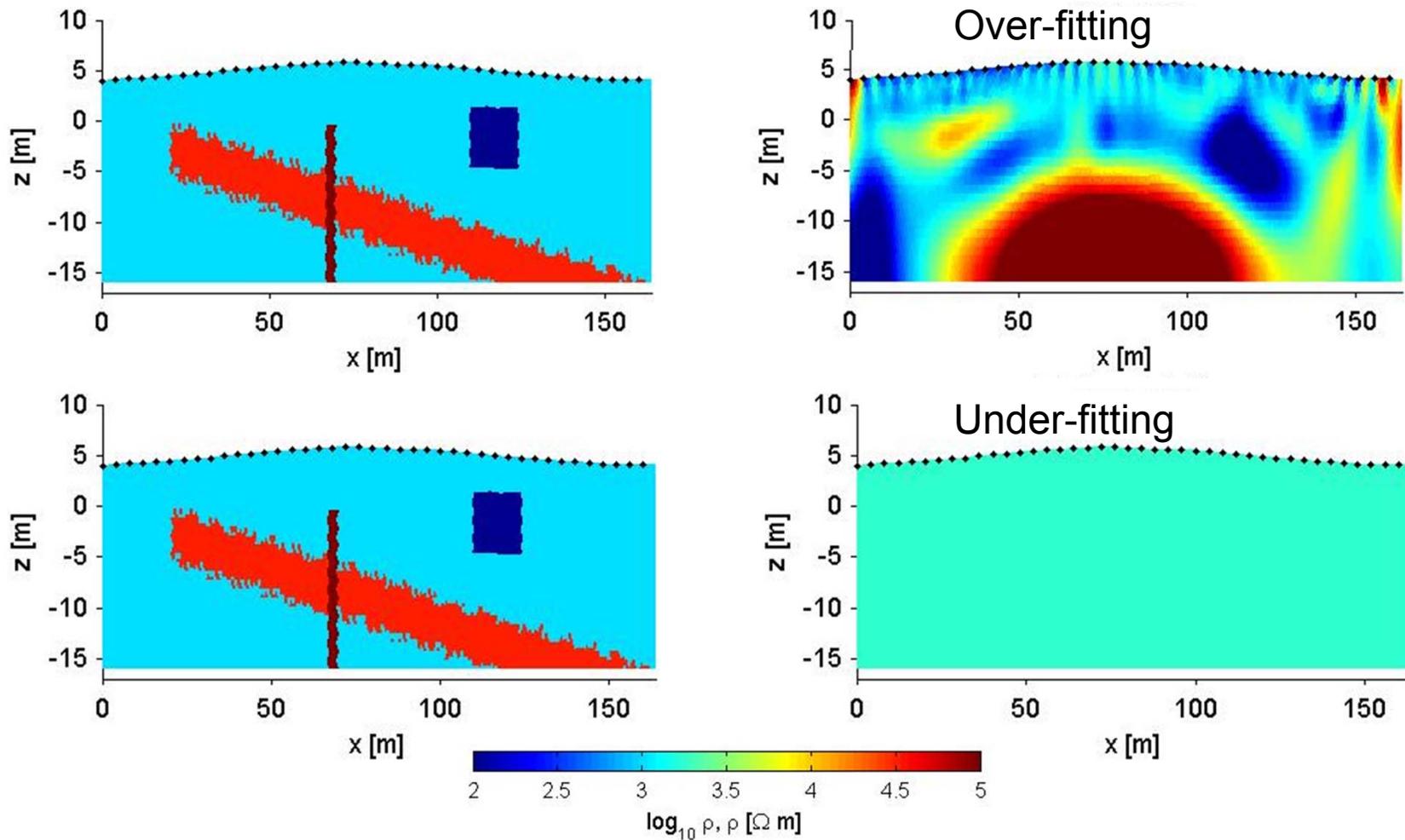
# Forward modeling and inversion

The inversion is an ill-posed problem, because:

- Non-uniqueness: different solutions for the same data (i.e., different models of the subsurface can explain the same dataset)
- Instability: small changes in the data (i.e., error) may lead to high changes in the solution (model)



## Artifacts vs. loss of resolution



# Inversion algorithms - FE

- Finite-element techniques
- Flexibility to incorporate topography
- May solve heterogeneities with higher resolution than other techniques, e.g., “finite-differences”.

