

KMS Technologies - KJT Enterprises Inc.

Presentation

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2000

**Exploration with LOTEM under basalt
cover**

**Society of Exploration Geophysicists,
Annual meeting, Calgary, invited paper in
workshop "Advances in Electromagnetics"**

Exploration with LOTEM under basalt cover

P.B. Pandey¹ & K.-M. Strack²

Calgary 2000

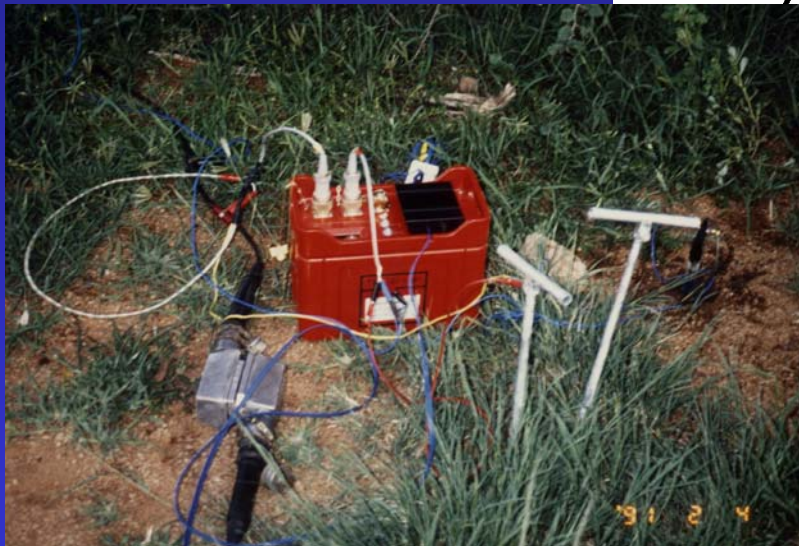
¹ ONGC, India

² KMS Technologies , Houston Texas

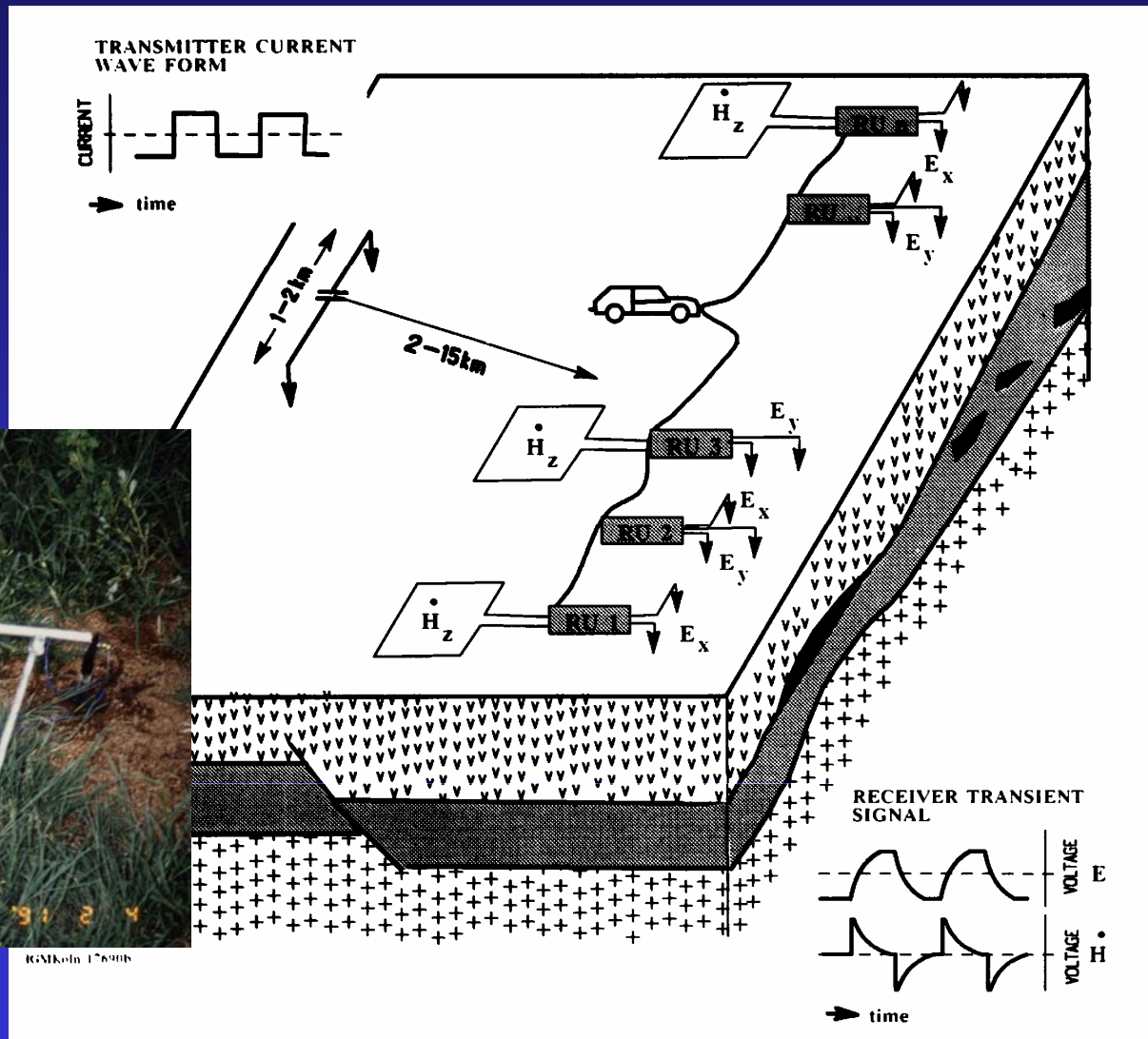
Outline

- The Method
- India case history
- Summary

System layout



RMKohn 17690b

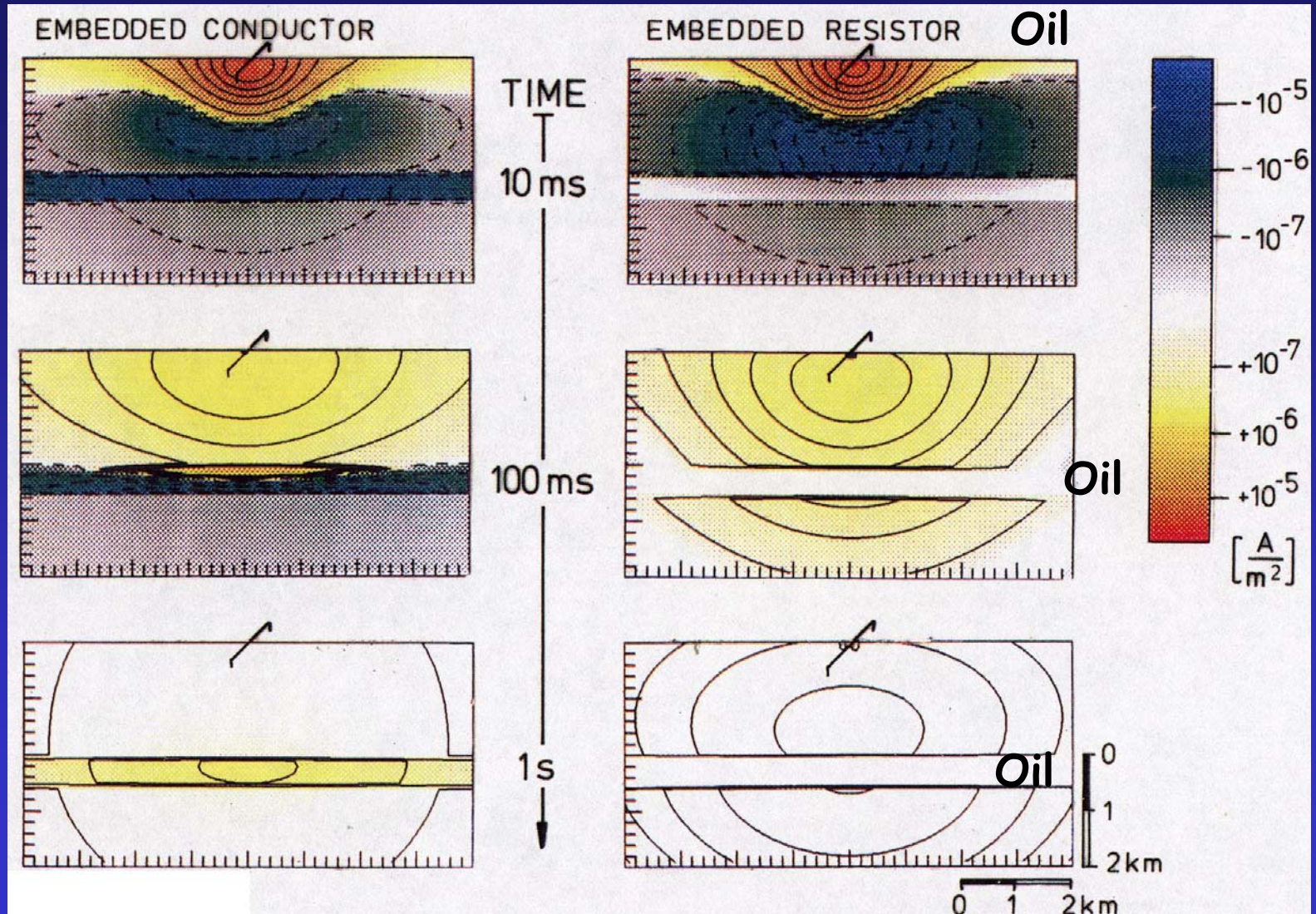


Current densities in a reservoir

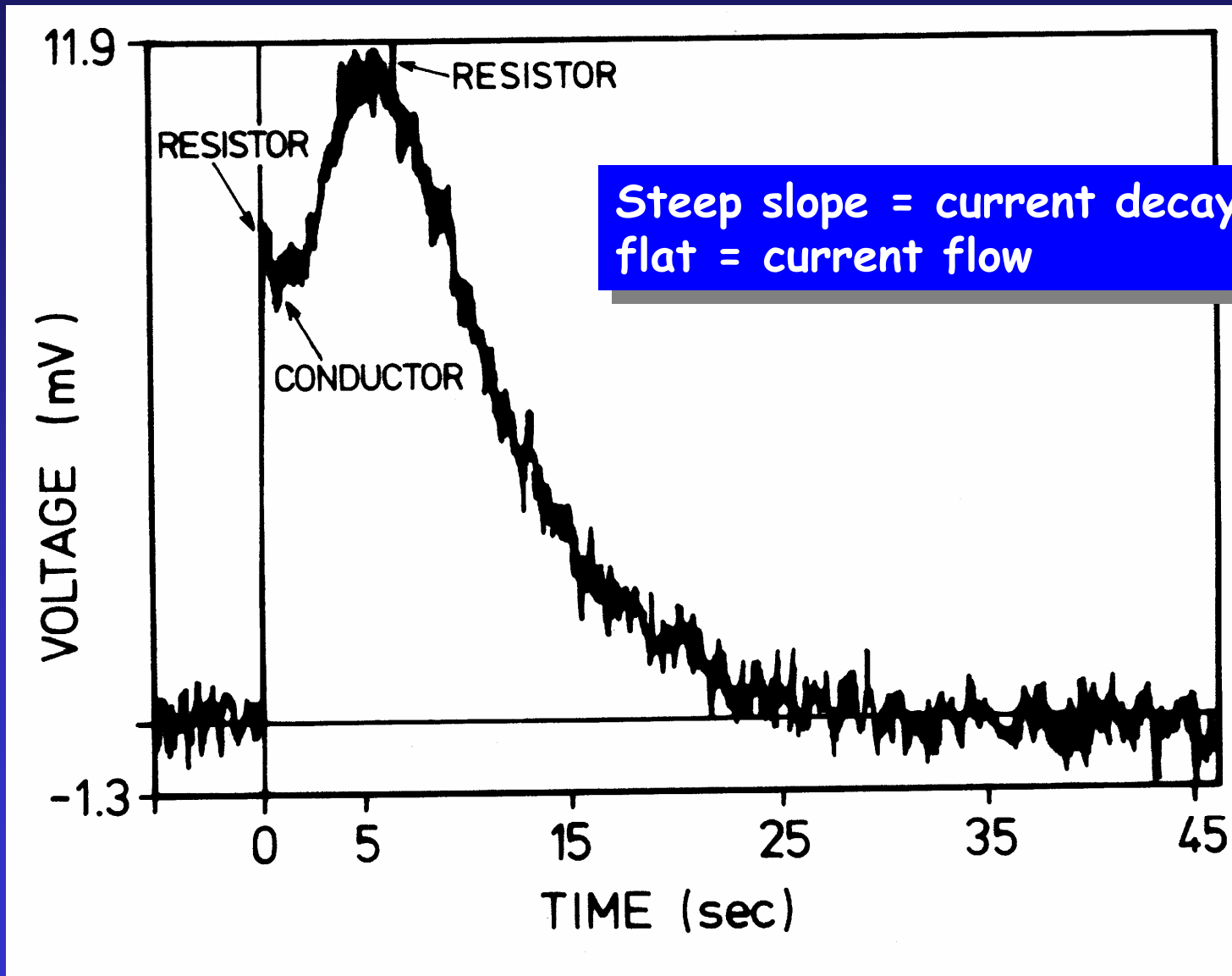
brine

brine

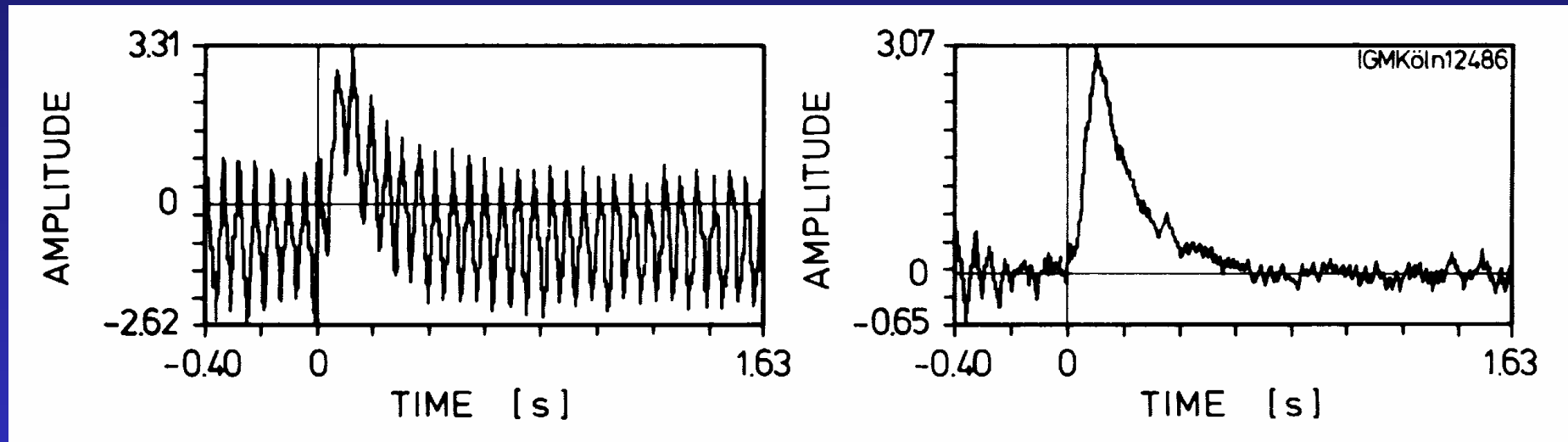
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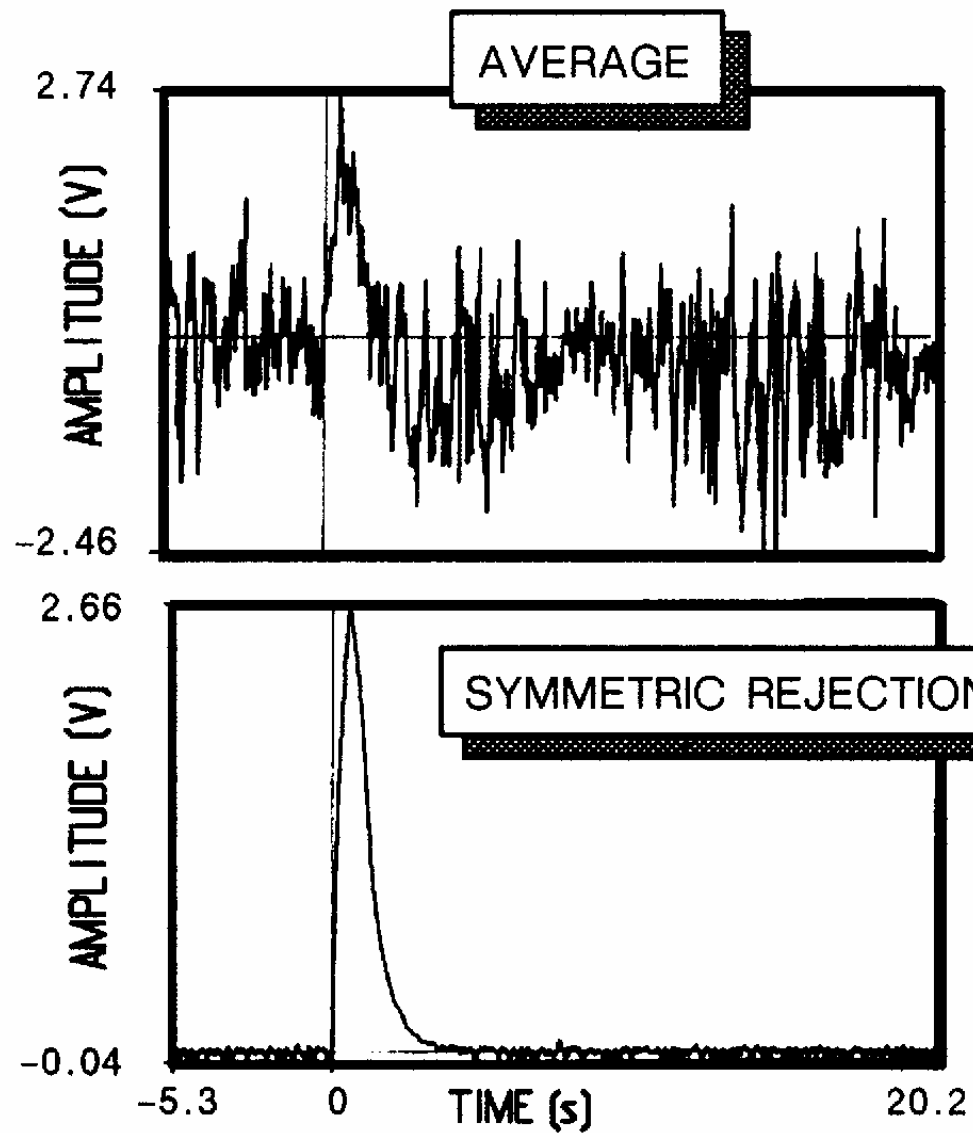
Typical transient



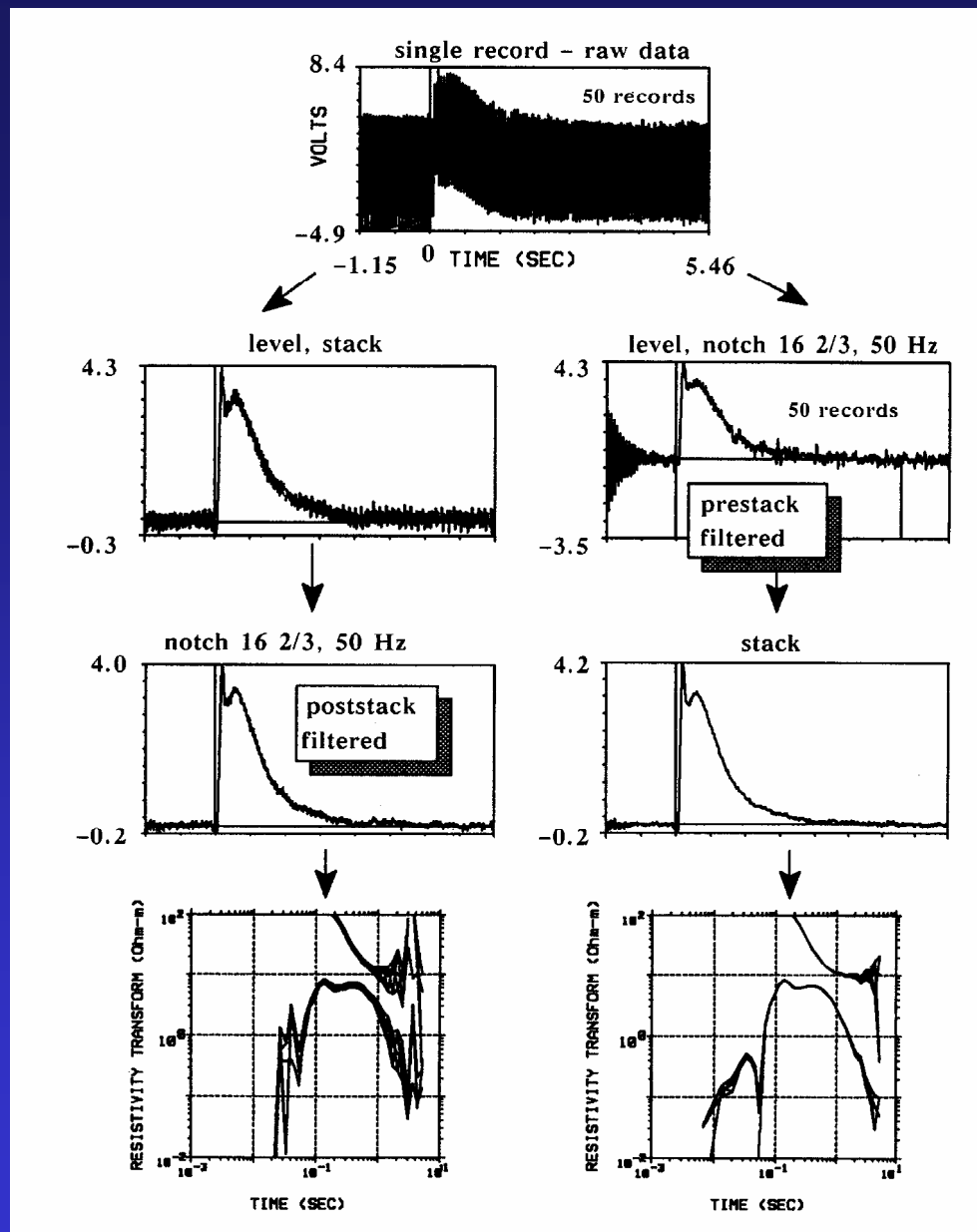
Example of digital notch filter



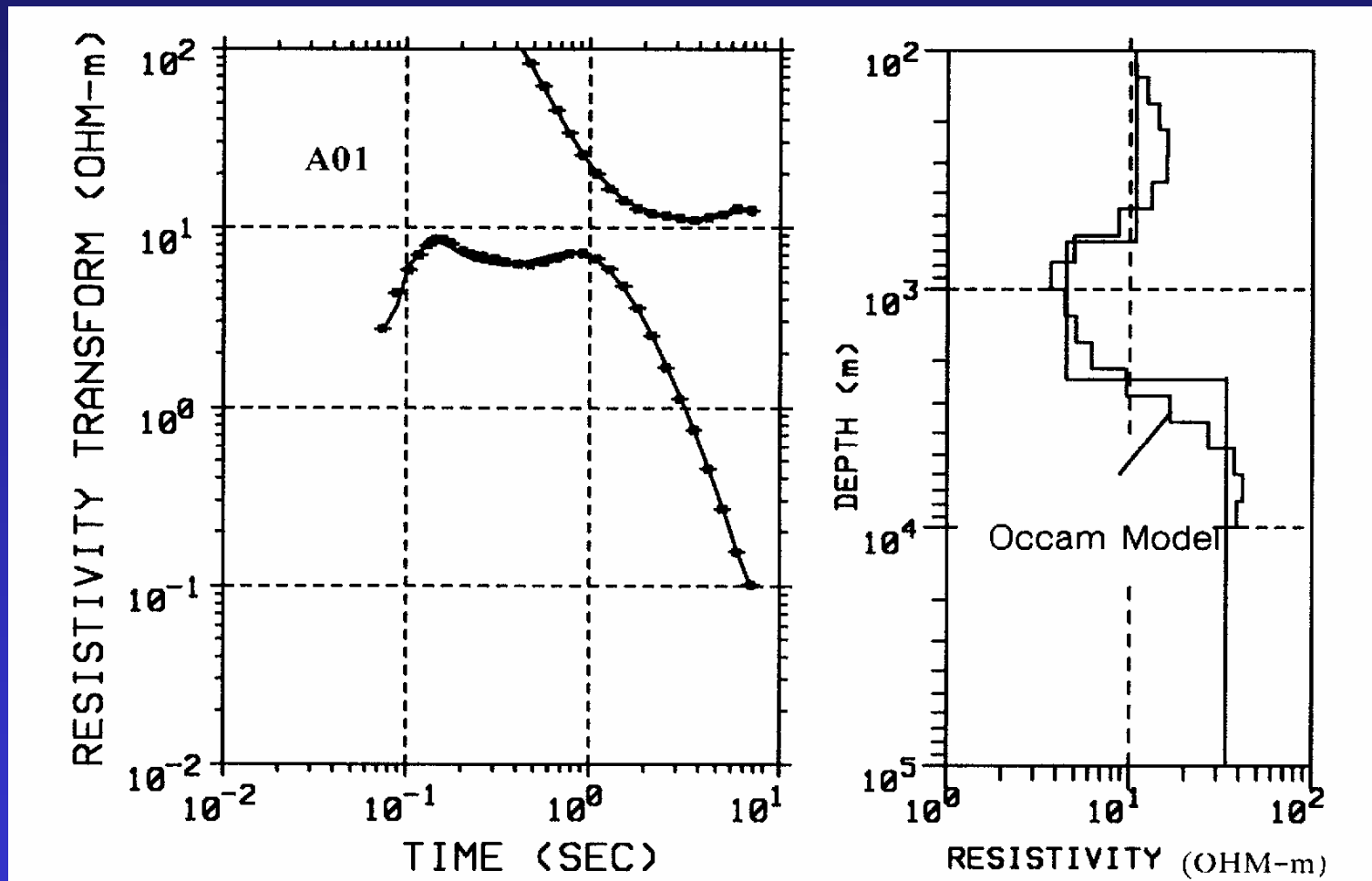
Selective stack example



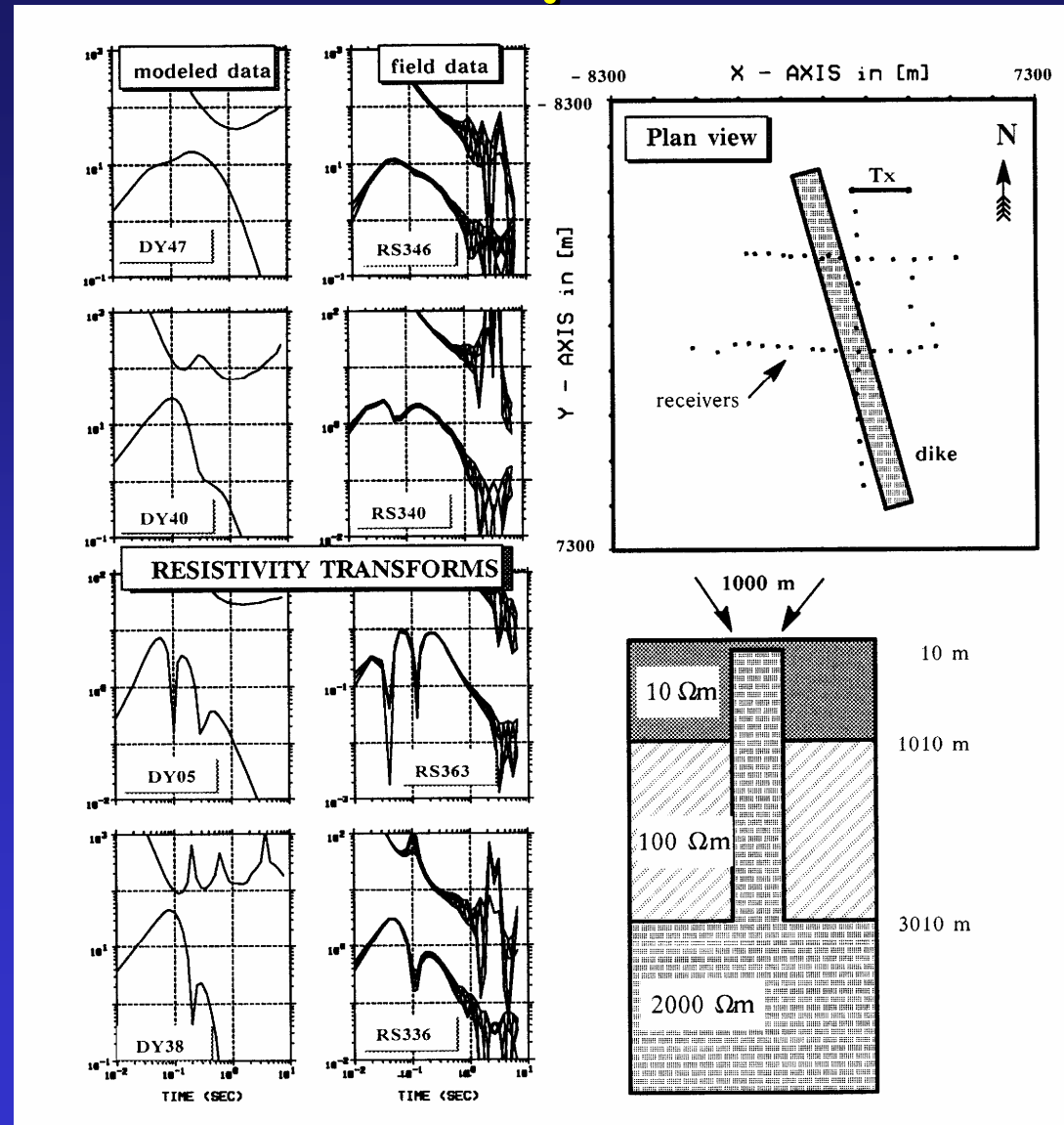
Pre-stack versus Post-stack processing



Occam's inversion example



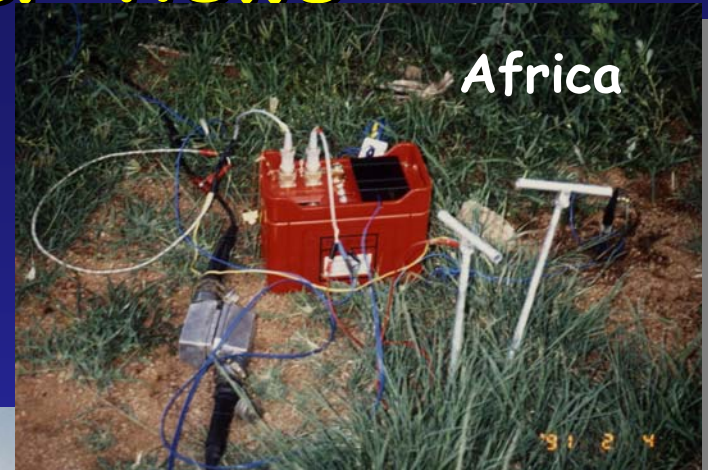
3D reversal example: axial conductor



Hardware: Receiver views

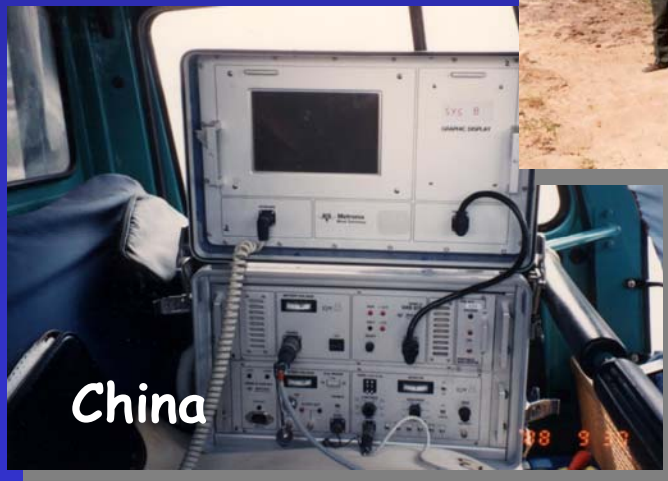


Germany



Africa

India



China



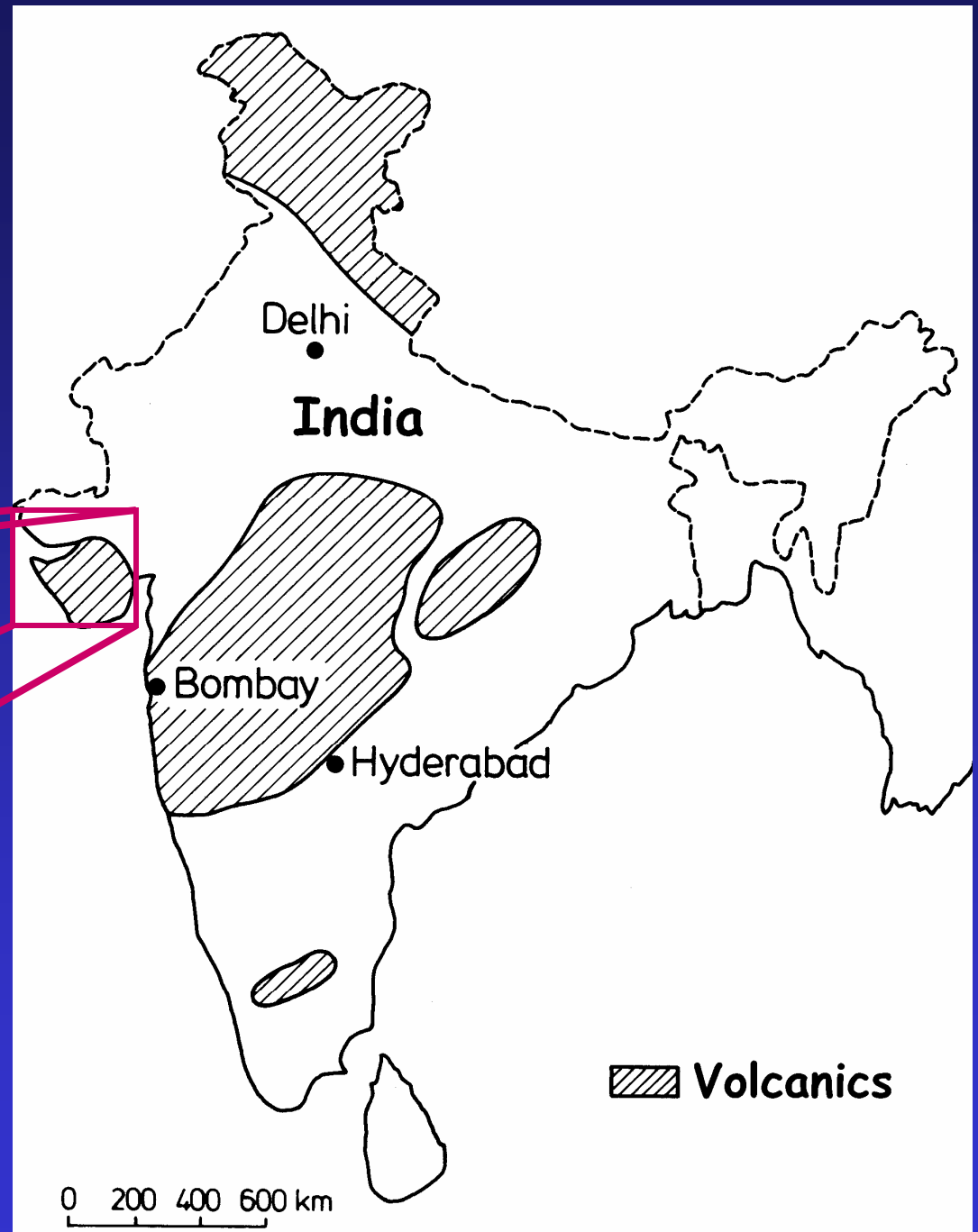
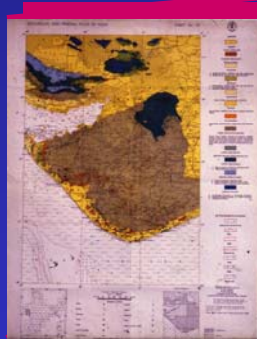
USA

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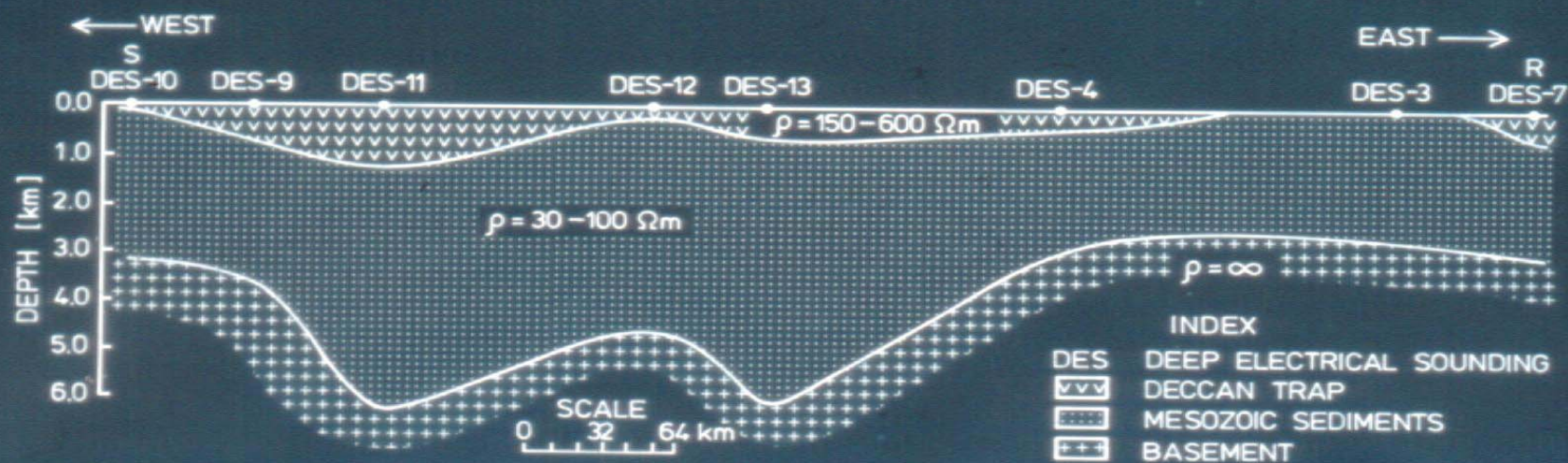
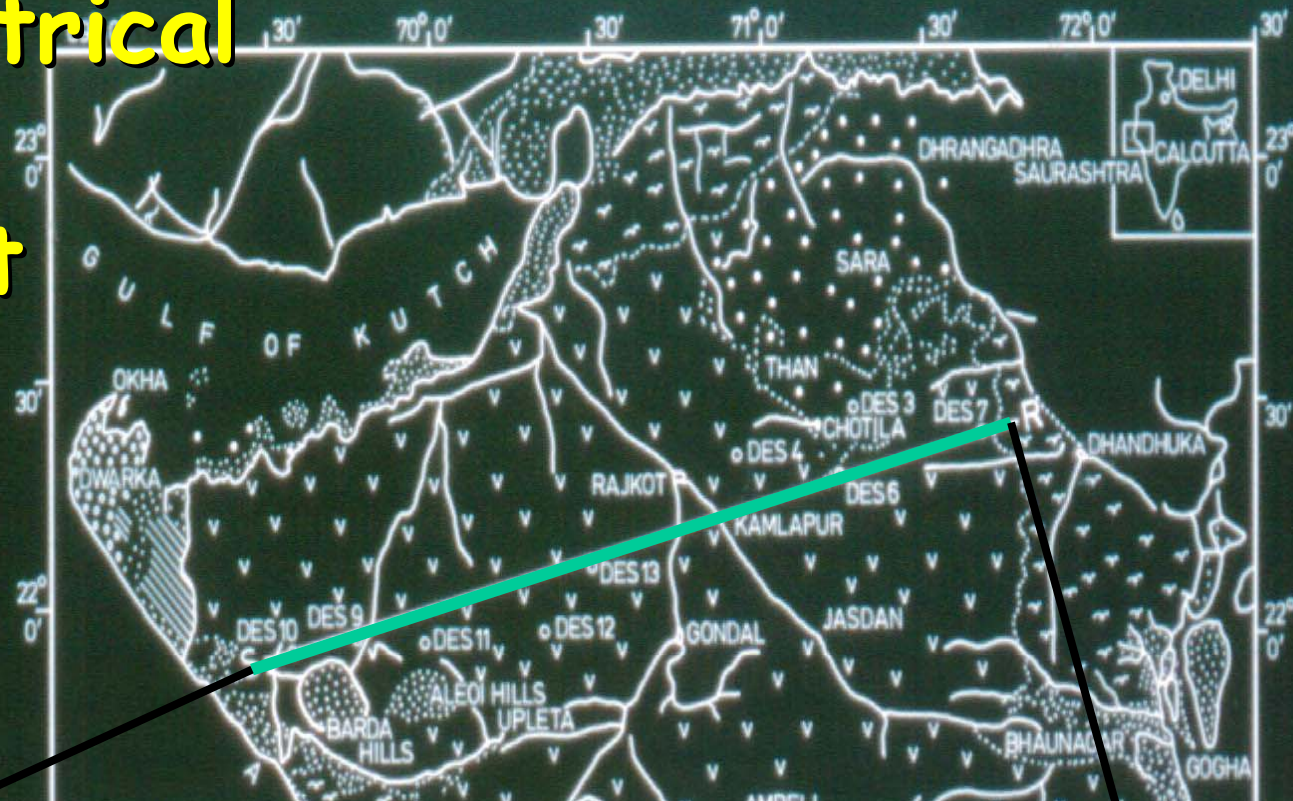
India trap basalt flows



0 50 km

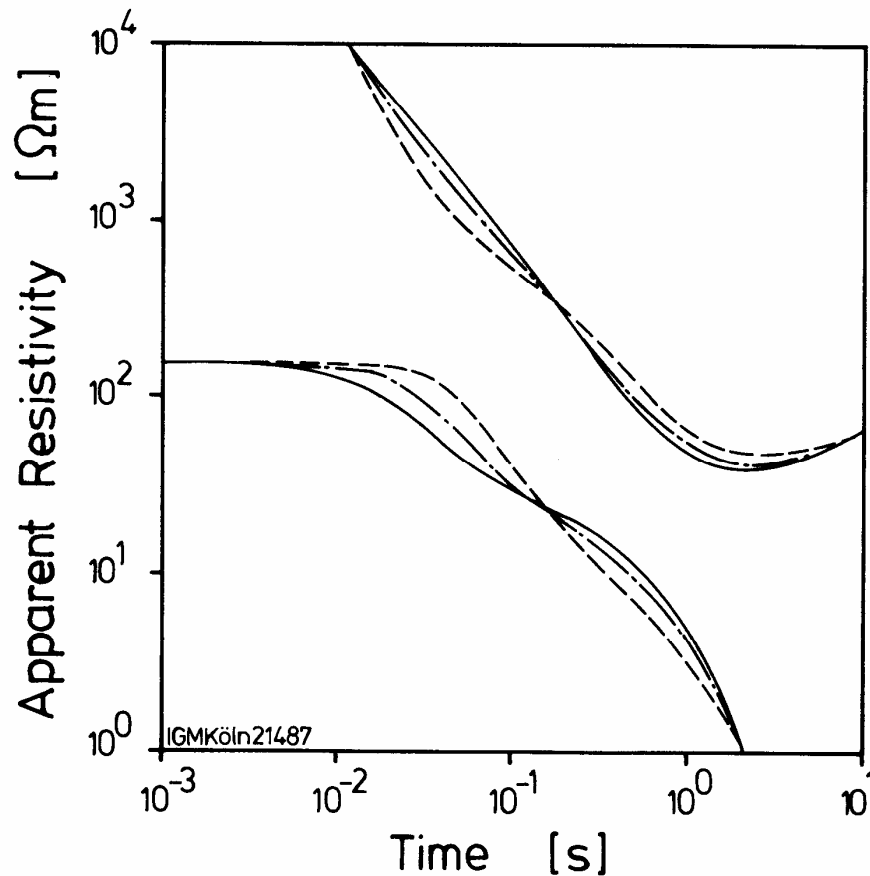


Deep Electrical Soundings of Gujarat

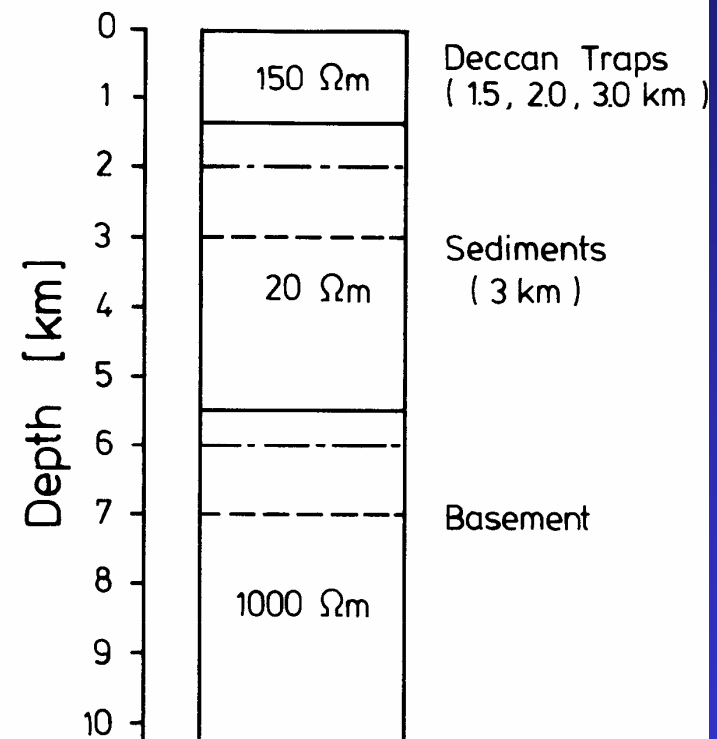


Synthetics before survey

SYNTHETIC CURVES

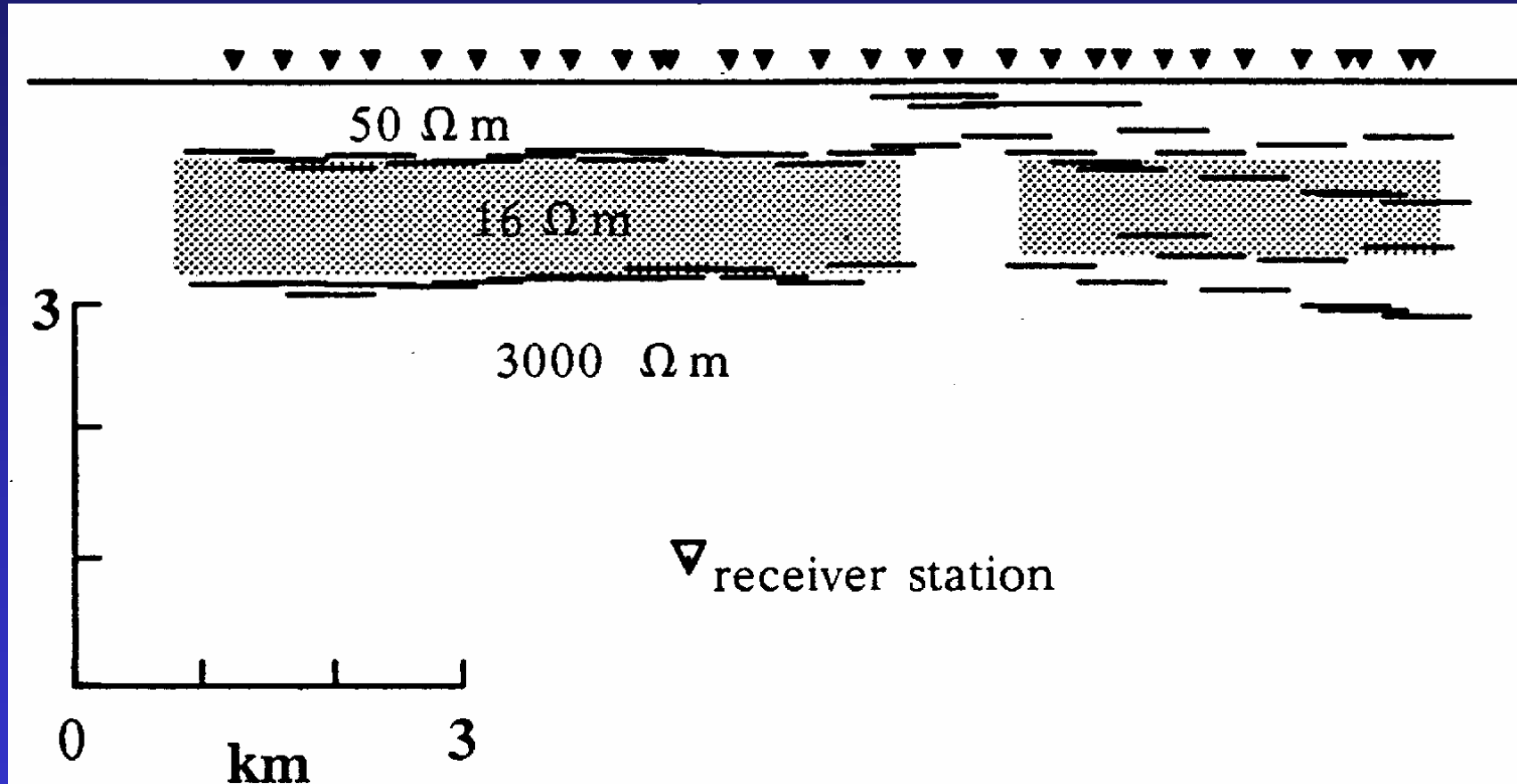


EARTH MODEL



Varied : 1st layer thickness
Offset : 10 km

Lotem section



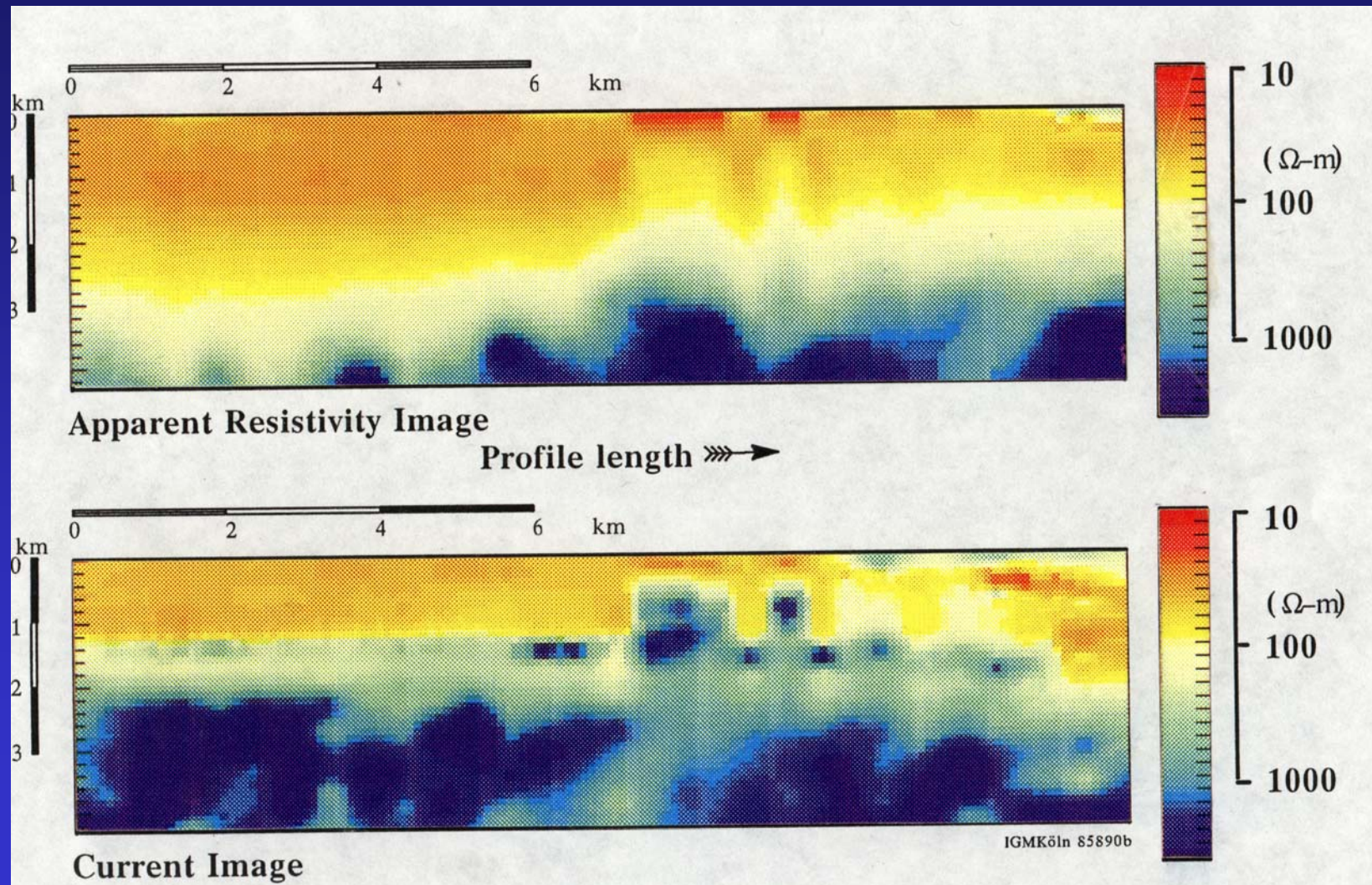
Dyke photos



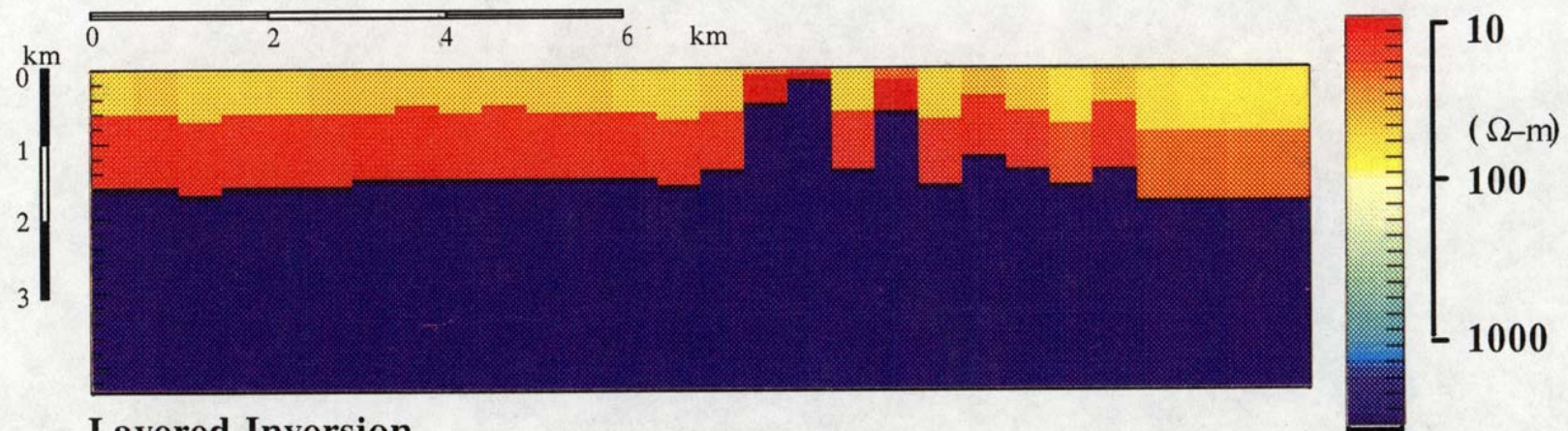
KMST000017ff

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Data appa & current image

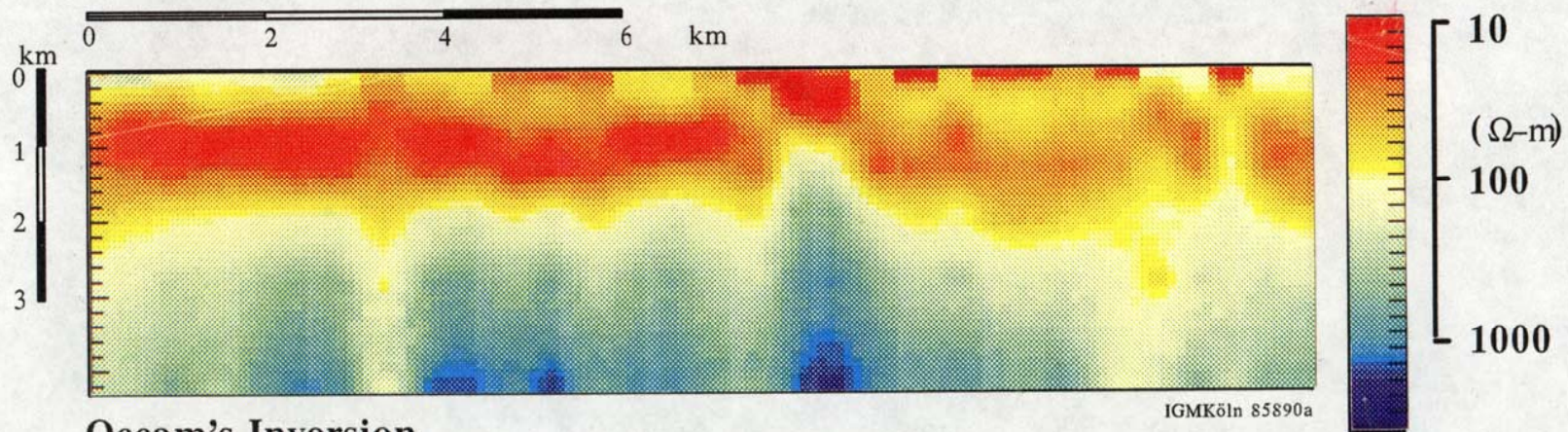


Layered & Occam's inversion



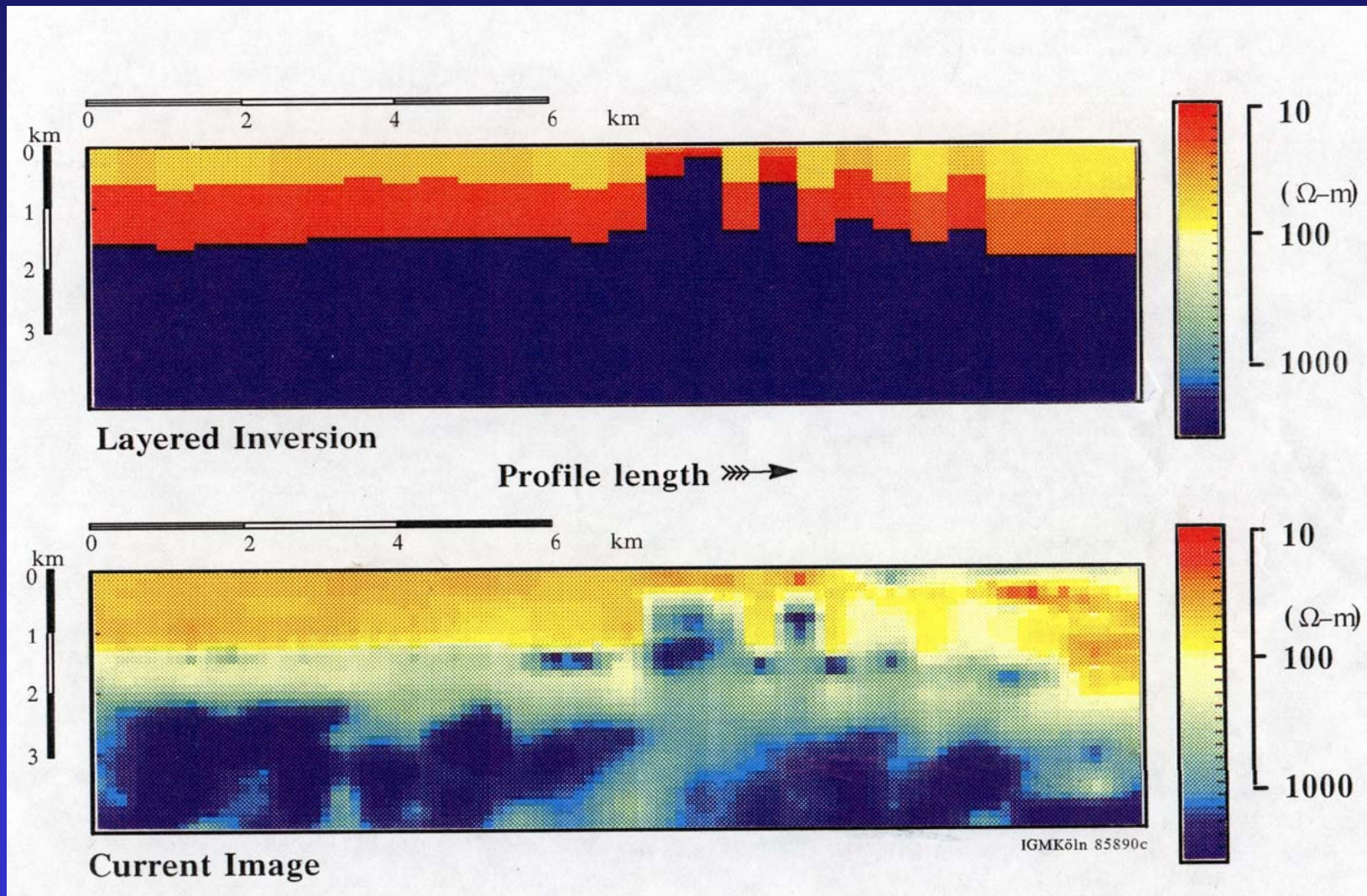
Layered Inversion

Profile length $\ggg \rightarrow$

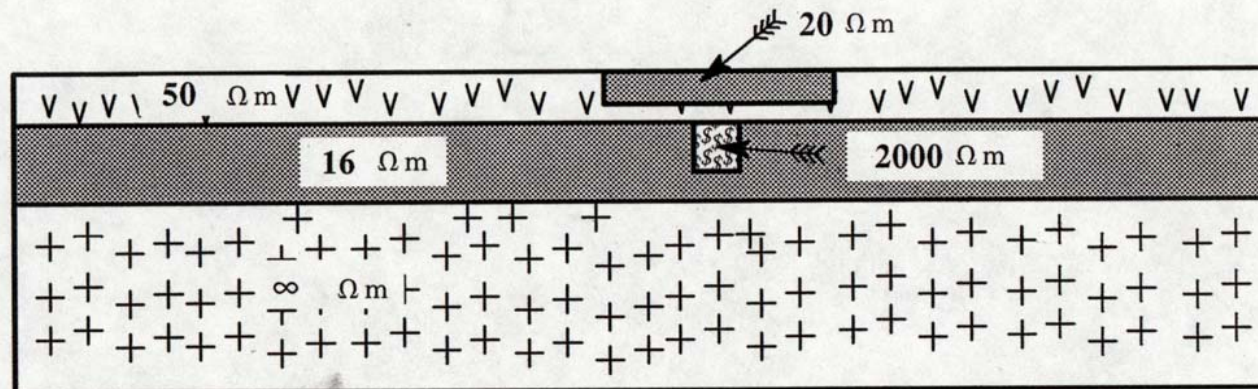


Occam's Inversion

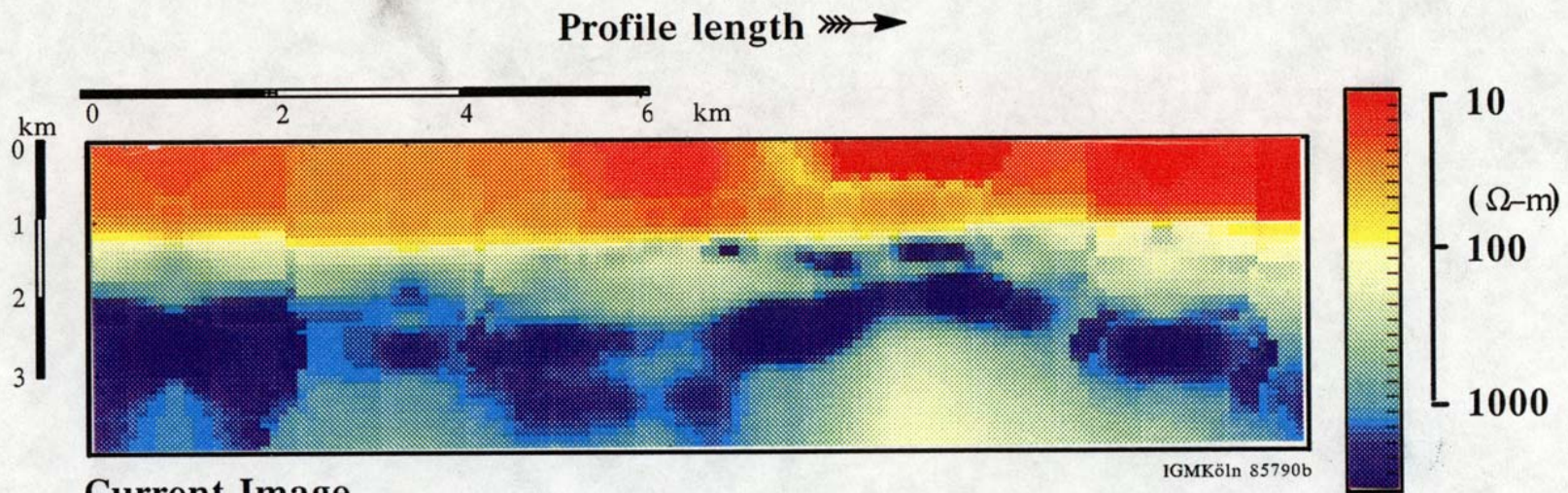
Inversion versus image of dyke data



3D image of dyke model

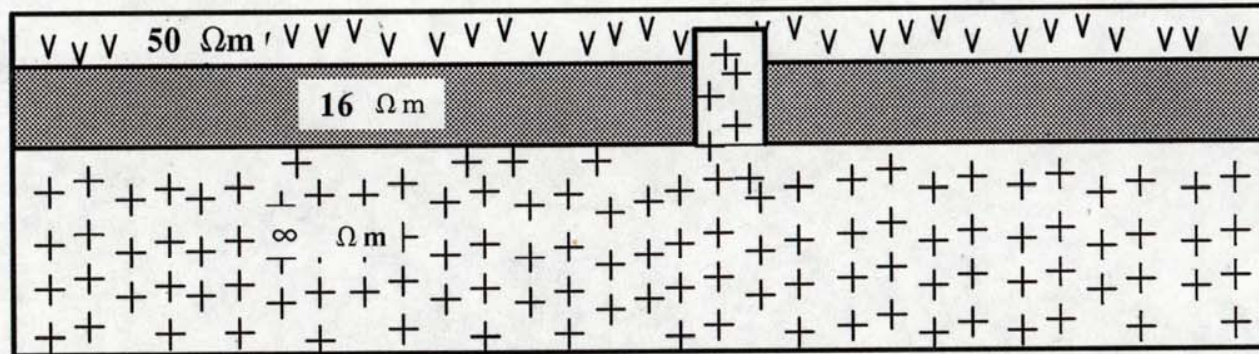


Model Section



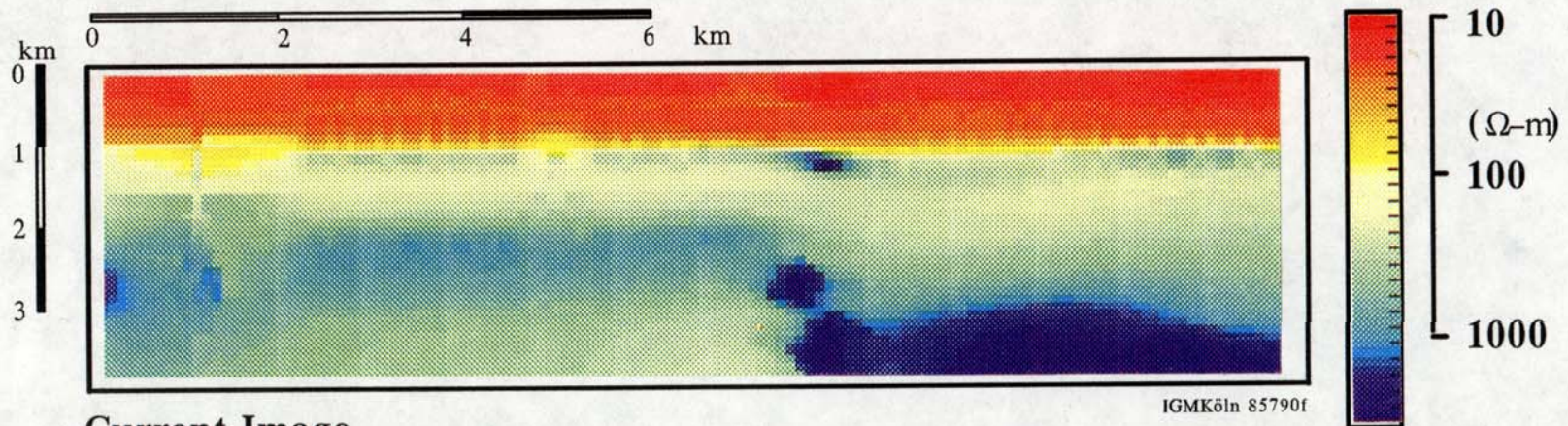
Current Image

3D image of dyke model: model 2



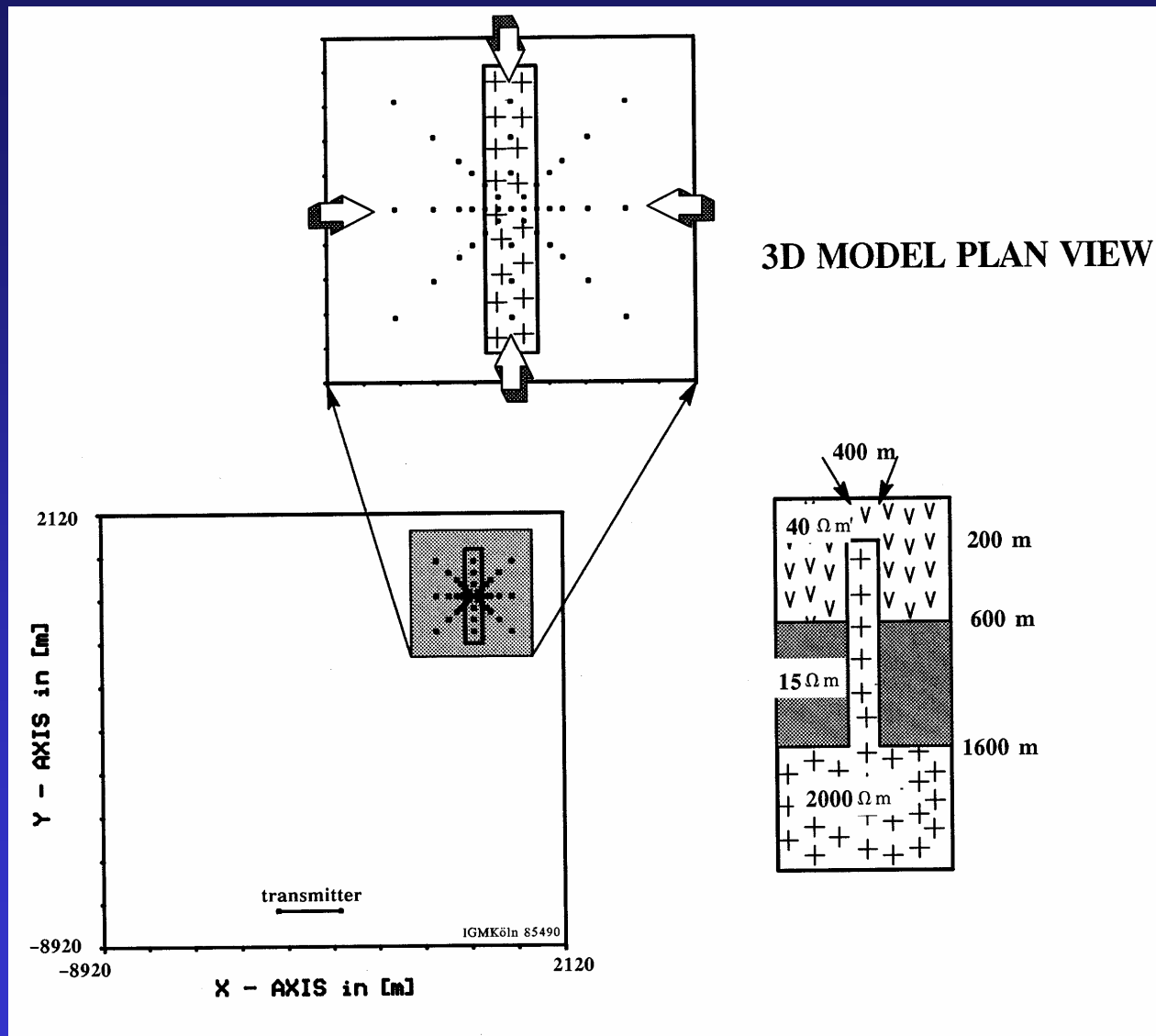
Model Section

Profile length

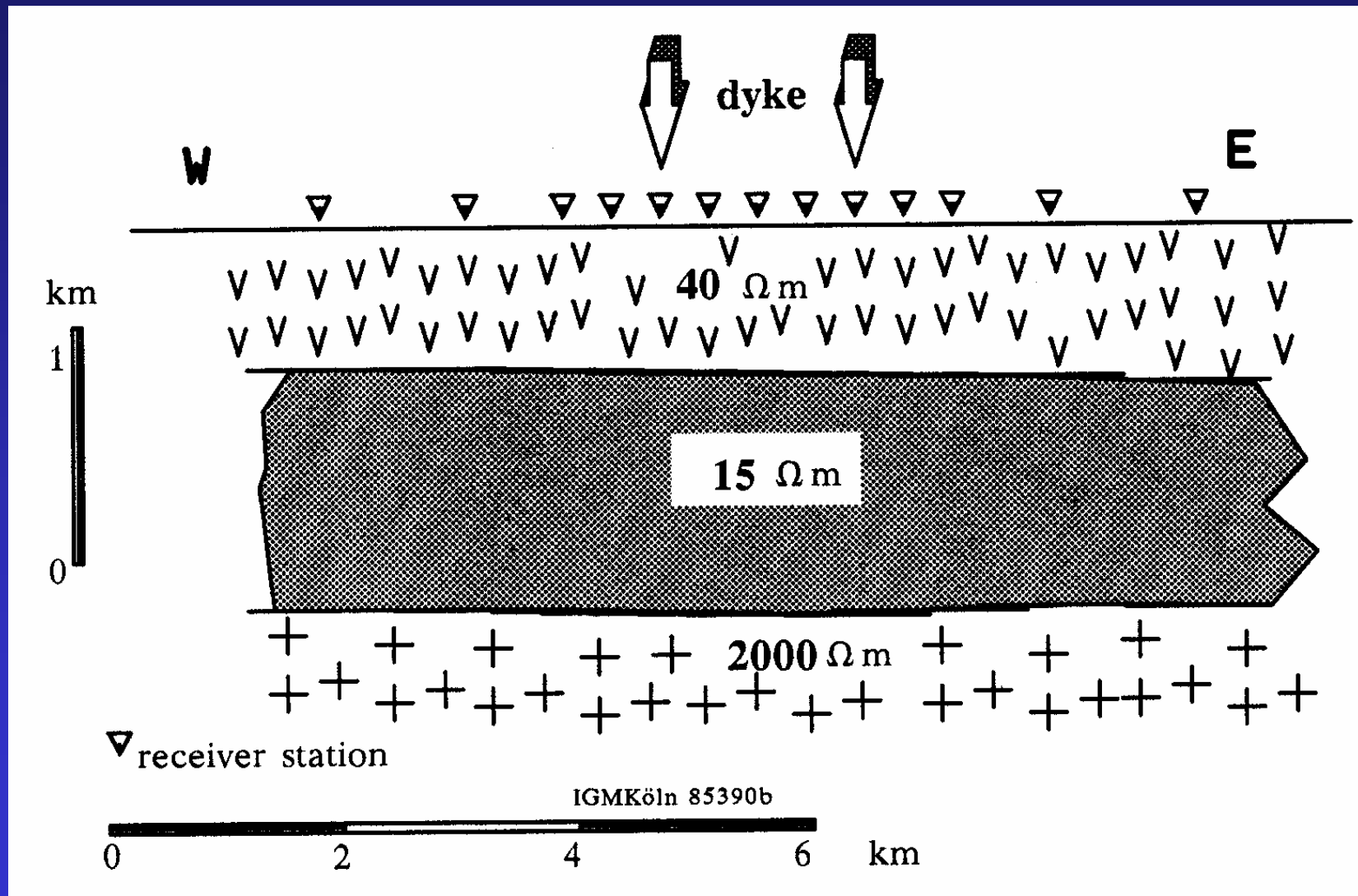


Current Image

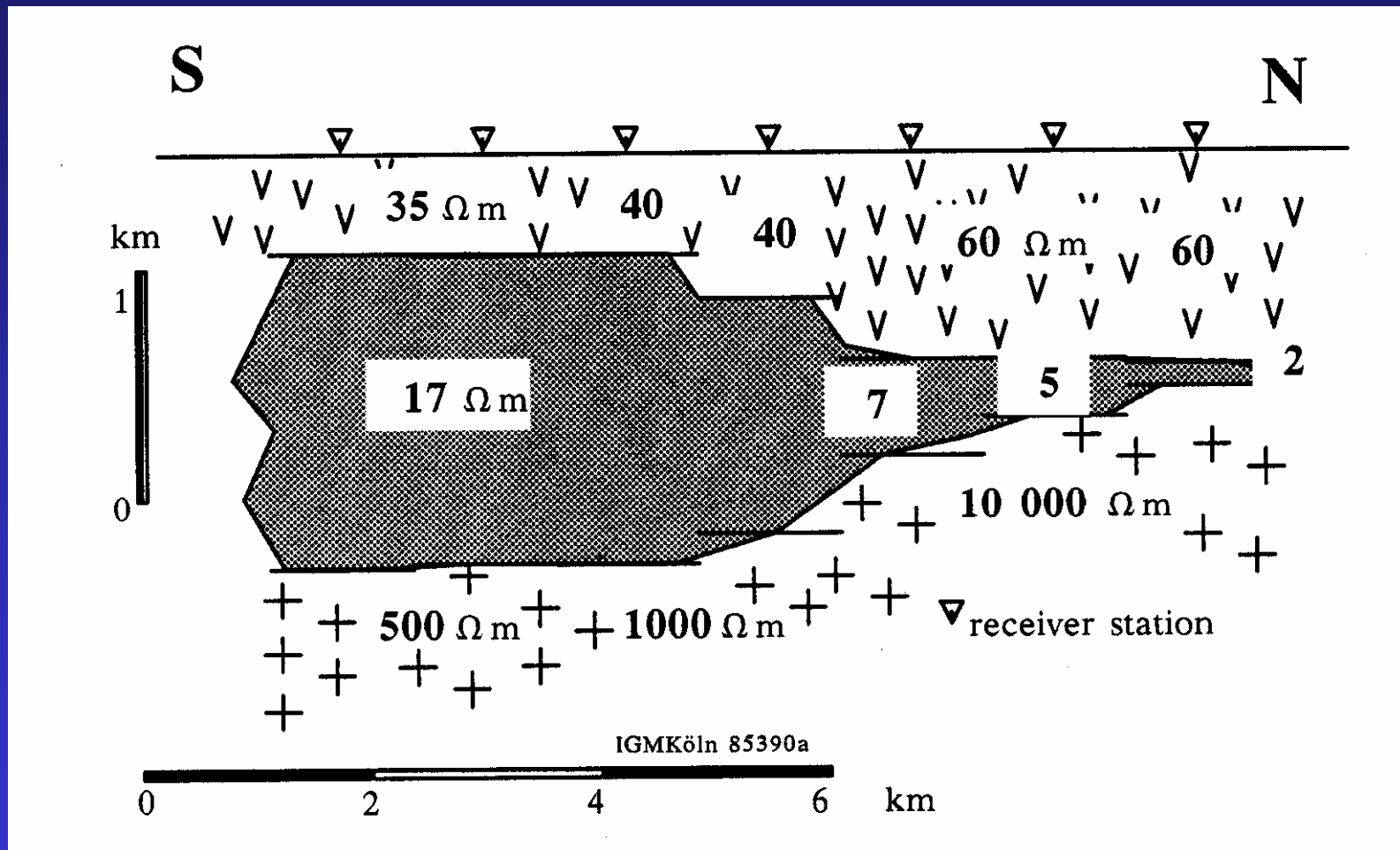
Dyke model survey plan



Dyke 1D inversion of 3D data - Hz



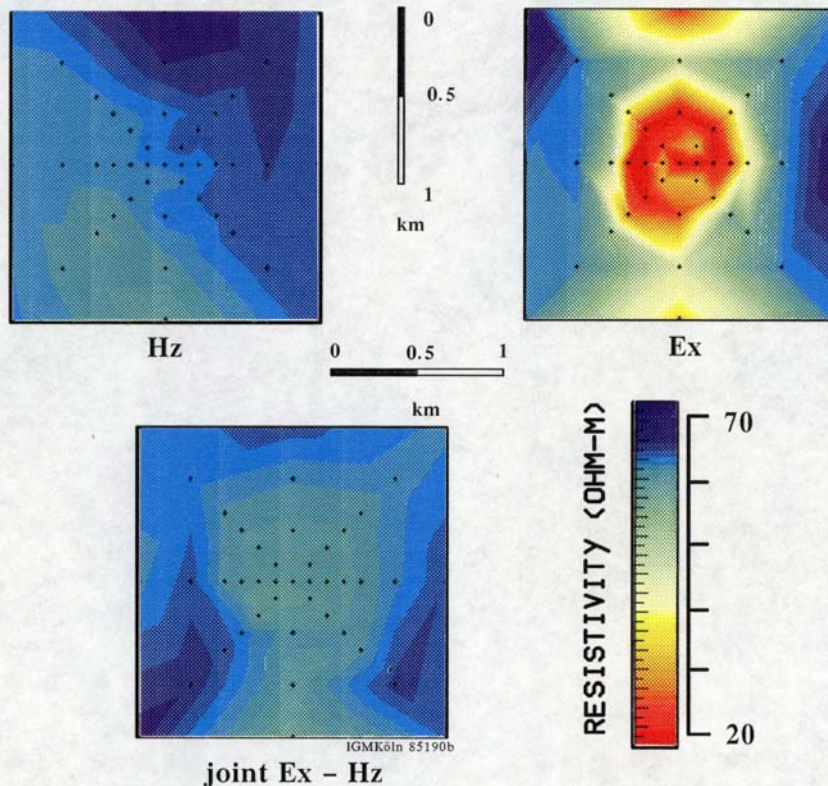
1D inversion of 3D data - Hz



Single parameter maps

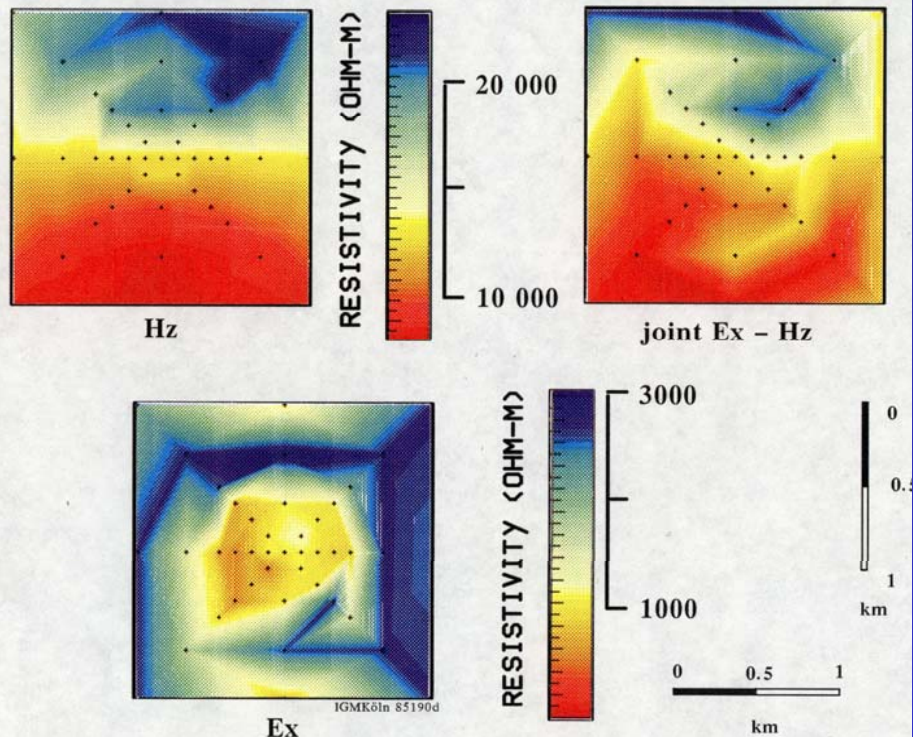
1st LAYER RESISTIVITIES

1 D Inversion of 3D data

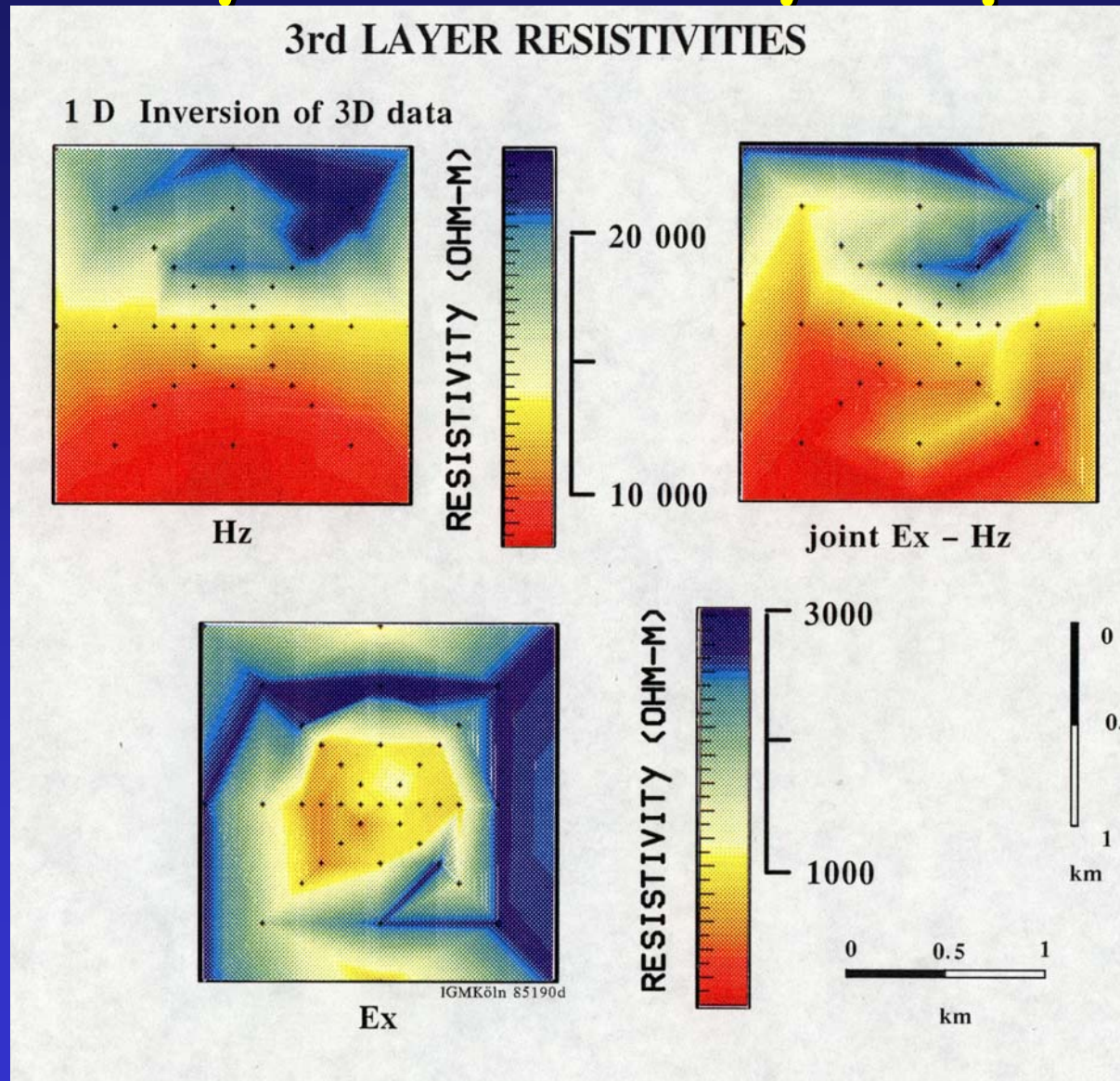


3rd LAYER RESISTIVITIES

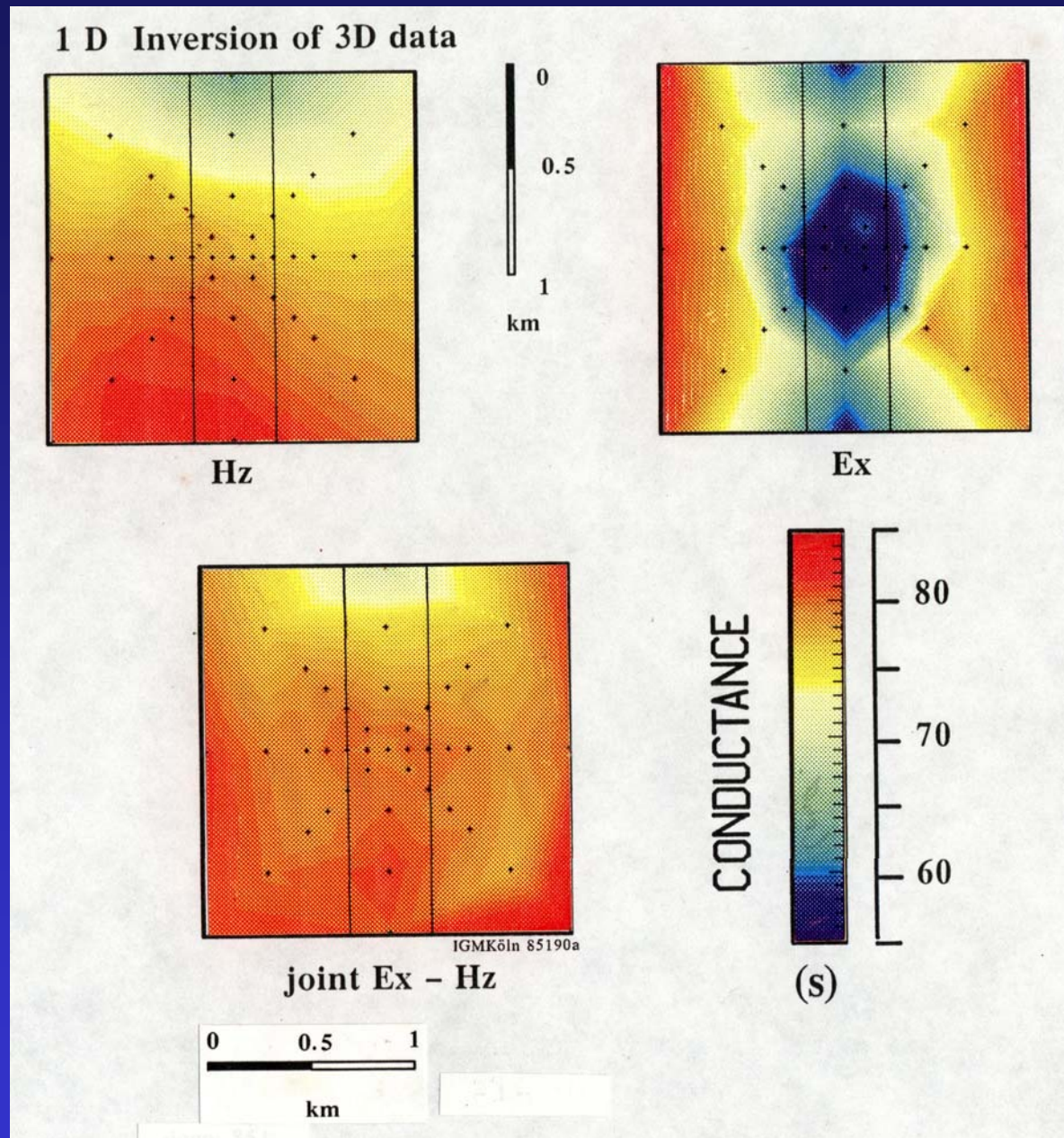
1 D Inversion of 3D data



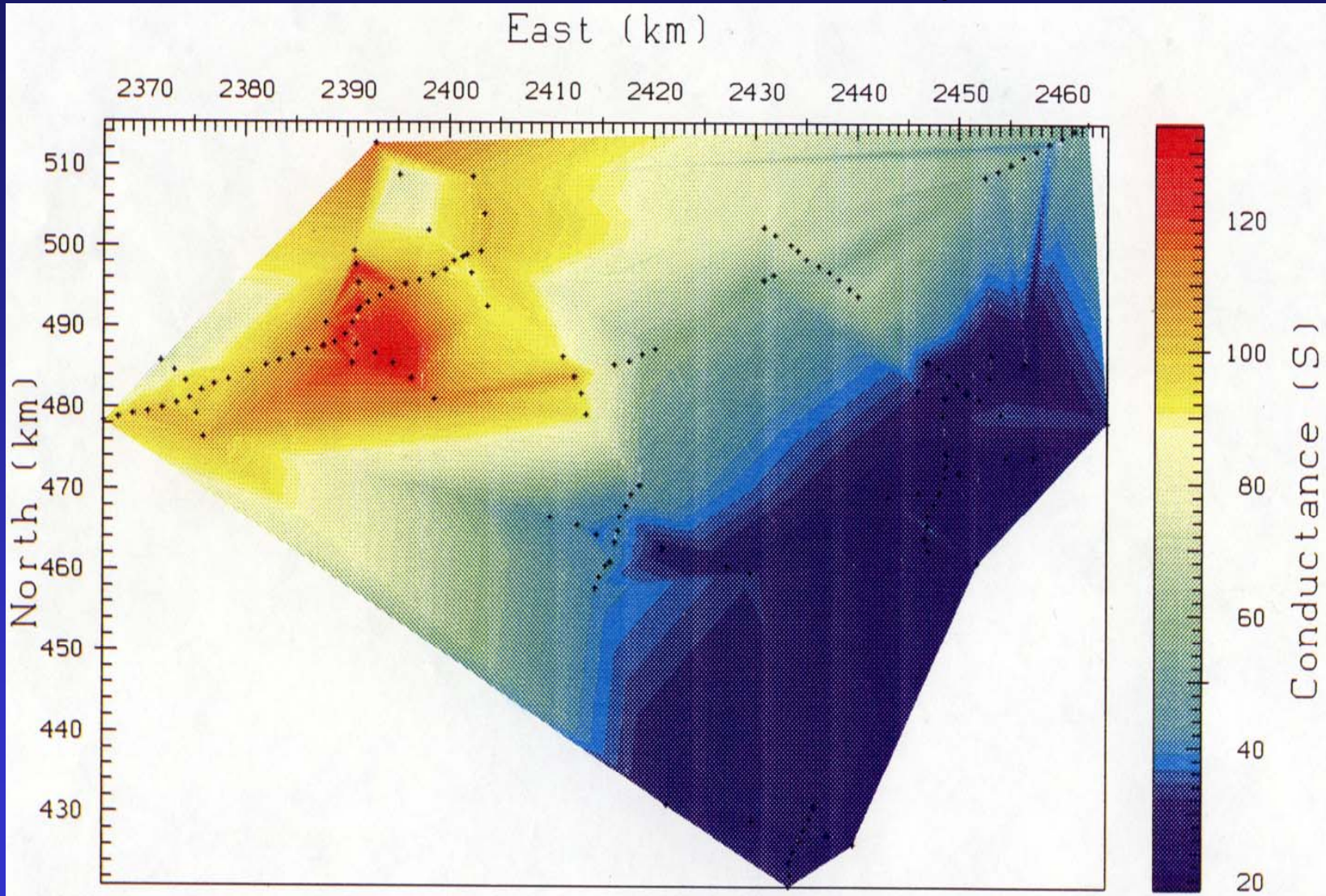
3rd layer resistivity map



Dyke total conductance 1+2 layer



Total conductance map



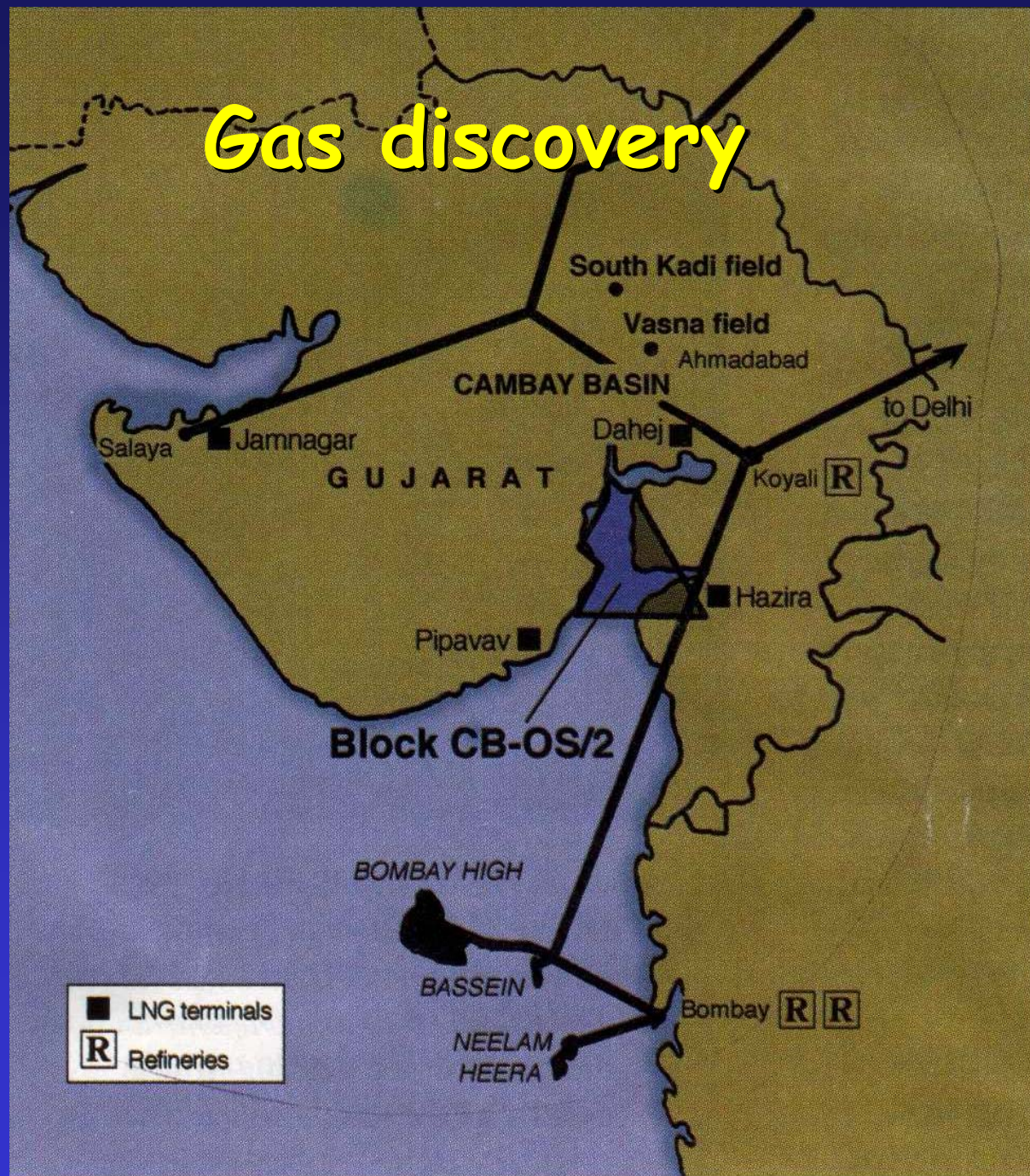
Outline

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Summary

- Lotem - a well understood method
- Hardware systems commercially available
- Seismic style data acquisition
- Seismic style data processing
- Interpretation tools exist (1D, 3D)
- More experience needed
- Lotem in Gujarat was confirmed by well

Gas discovery



After Hart's E&P 7/2000

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LOTEM case histories locations

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