

**FIELD APPLICATIONS INVITED TALK:  
TORLEIF DAHLIN**

[Lund University, Sweden]

**Field applications of time-domain Induced  
Polarisation**

Torleif Dahlin<sup>1</sup>

<sup>1</sup> Lund University, Engineering Geology,  
torleif.dahlin@tg.lth.se

Data acquisition equipment for direct current electrical resistivity tomography (ERT) today commonly supports time-domain induced polarisation (TDIP) since a couple of decades (DCIP tomography). Since the last decade equipment is available that can deliver TDIP data of good quality at sites with favourable field conditions, whereas skilled operators and special field procedures are required at other sites. Data are typically inverted as integral chargeability in time intervals from tens of milliseconds to few seconds. The inverted models have proved to be very useful in a number of applications, including mineral prospection, delineation of waste deposits, characterisation of contaminated sites, engineering geological characterisation, etc.. In some cases the ERT part alone provides relatively unambiguous results, whereas for e.g. waste deposits and disseminated ores the resistivity parameter provides inconclusive results the addition of chargeability is essential for an interpretation of the site characteristics.

Inverted chargeability based on integral chargeability depends on the instrument type, transmitted pulse and integration interval. The results are thus generally not comparable between surveys unless identical instruments are used and minute attention is given to the instrument setup. Recent developments, including optimised input filter design and current transmission waveform, and signal processing has opened possibilities for extracting quantitative spectral IP (SIP) information from DCIP data acquired in a time efficient way. This opens potential for developing approaches for routine application of SIP in e.g. groundwater resources and vulnerability mapping, in a more quantitative way than has been possible to date.