IP Data Collection and Processing

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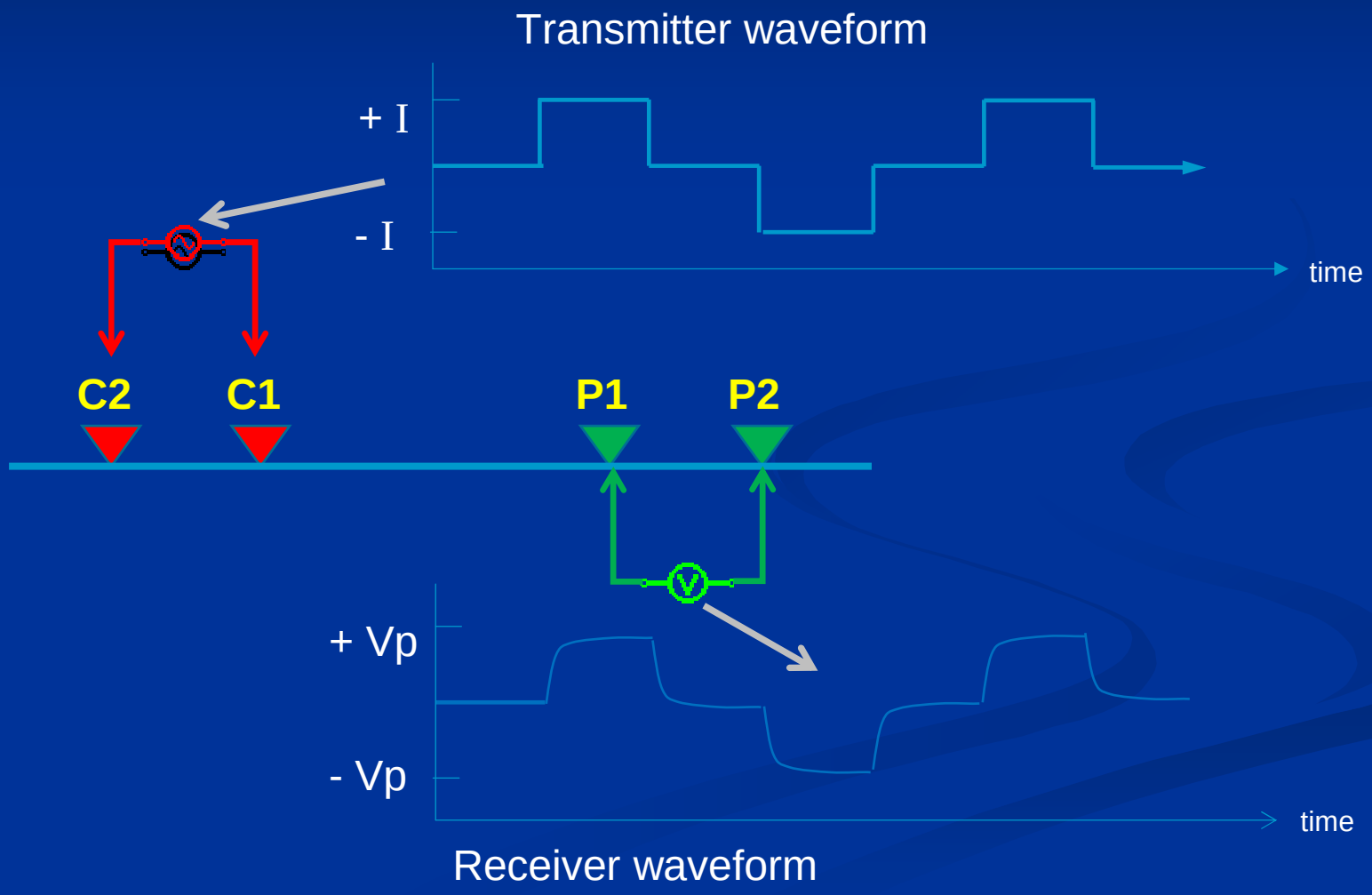
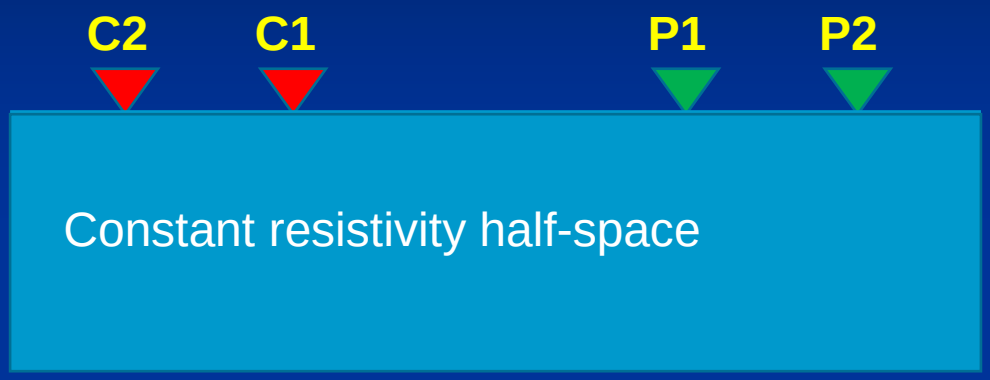
Topics

- Time domain IP theory
- Apparent resistivity
- Chargeability
- Time series data
- Problem data
- Dealing with tellurics
- Fixing field problems
- Deriving new data

Time Domain IP Theory



Time Domain Apparent Resistivity



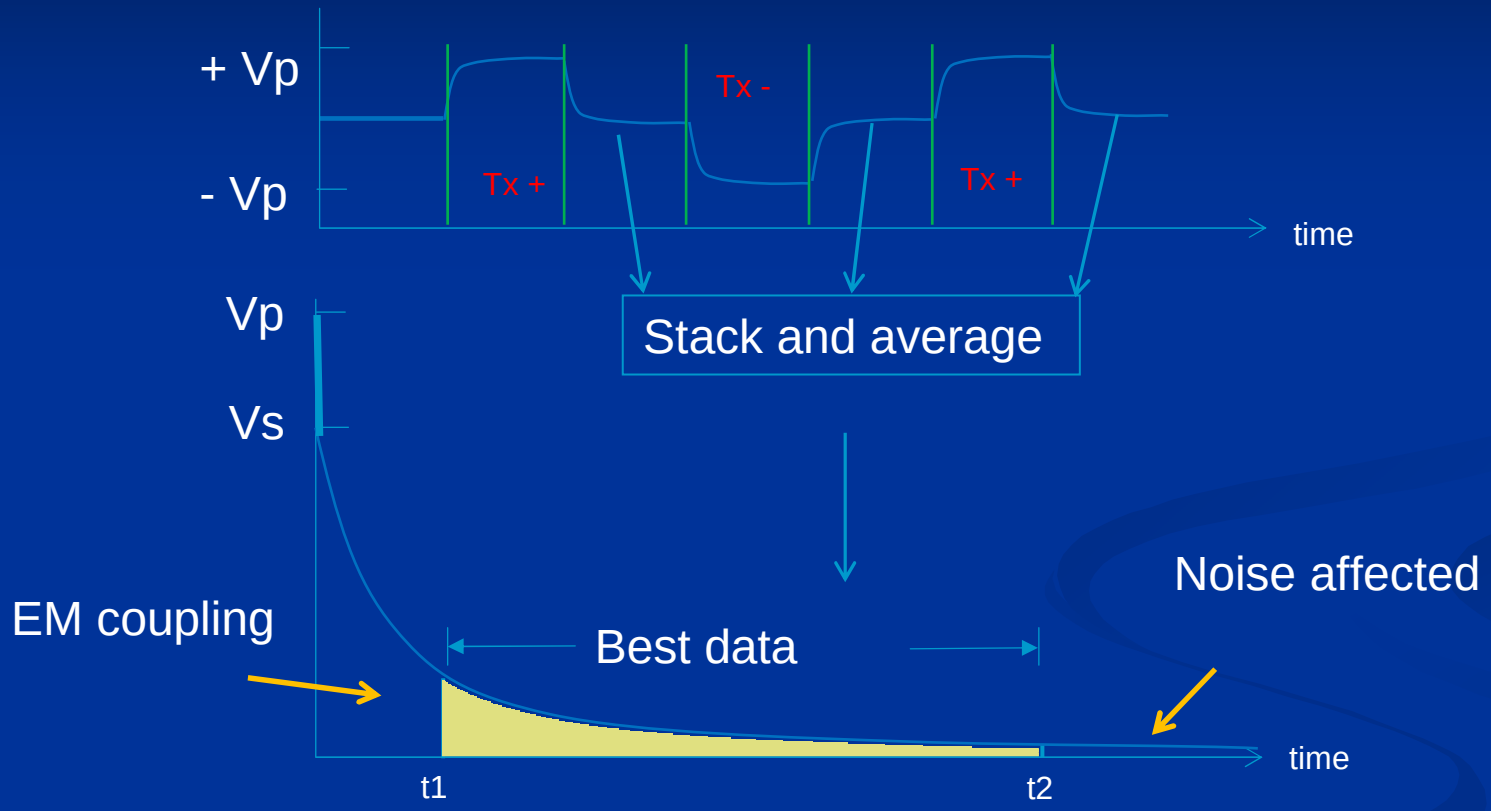
Transmitter current = I mAmp

Received primary voltage = Vp mV

Apparent half-space resistivity ρ = k.Vp / I Ωm

Geometric factor = k = 2 π /(1/rC1P1 - 1/rC1P2 - 1/rC2P1 + 1/rC2P2)

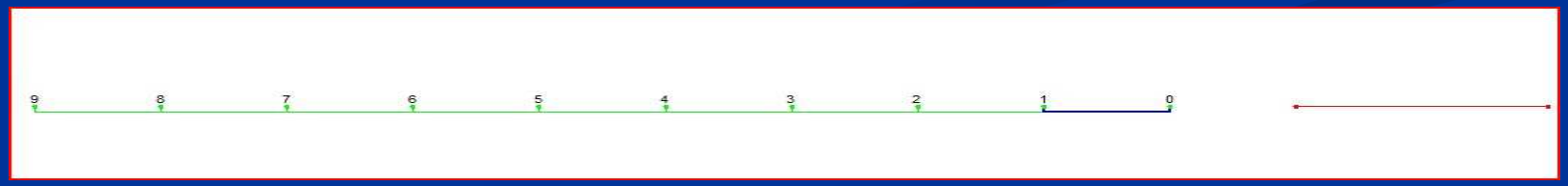
Time Domain Chargeability



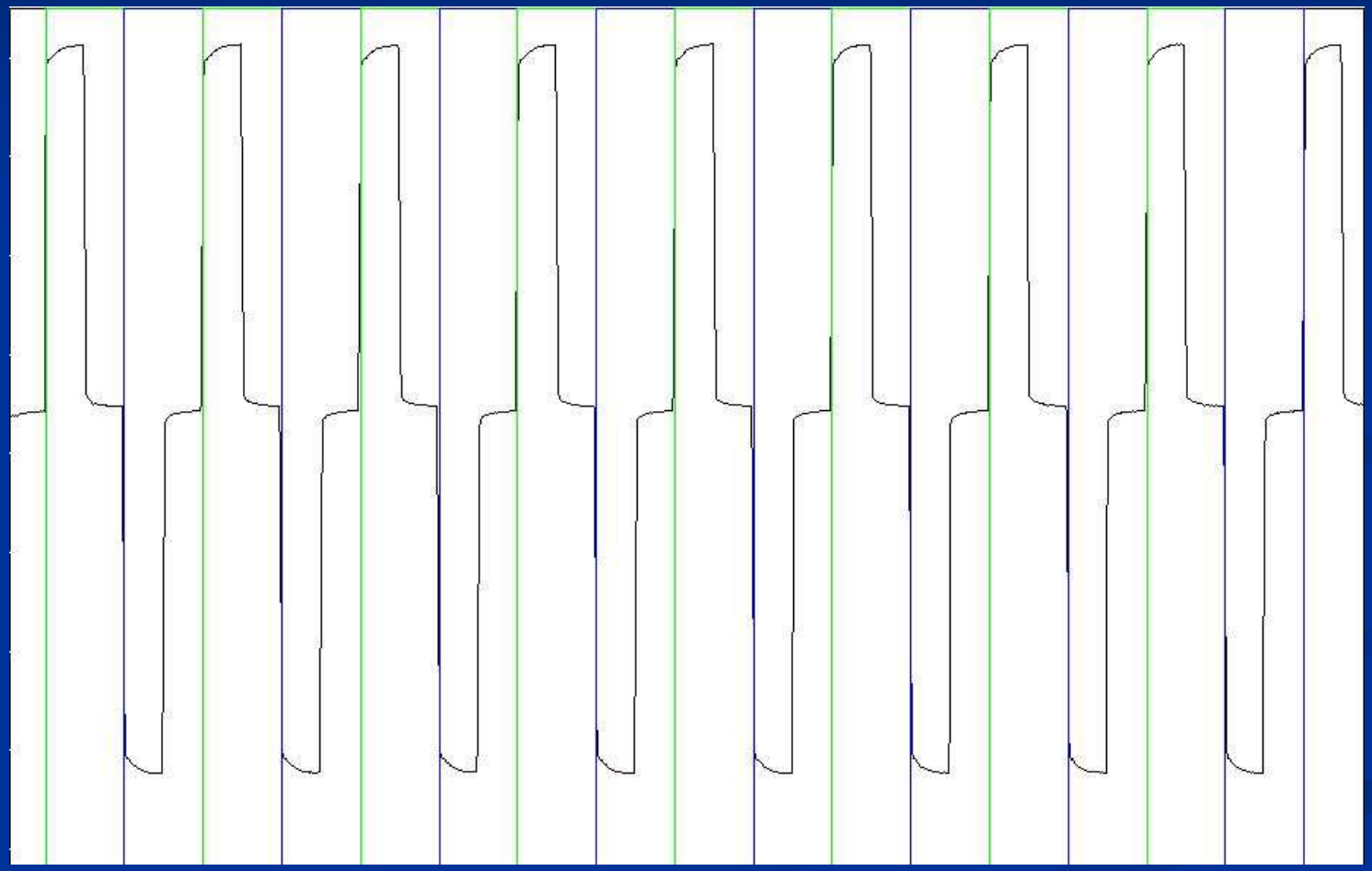
Apparent Chargeability $M_a = A/V_p = \int_{t1}^{t2} V(t)dt / V_p$

Newmont “standard” t1 = 590ms, t2 = 1450ms

Time Domain IP Data Collection

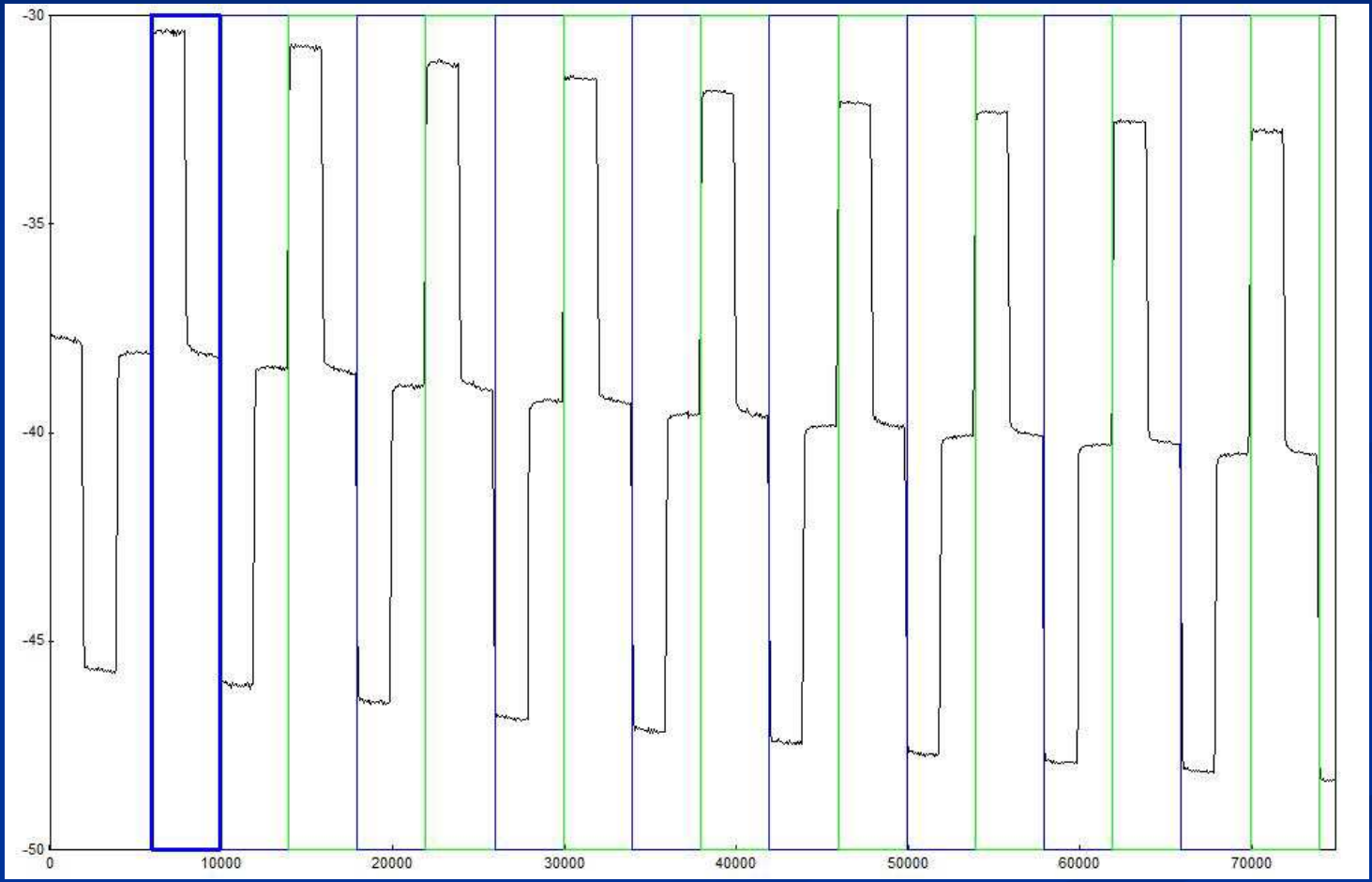


Time Domain IP Practice



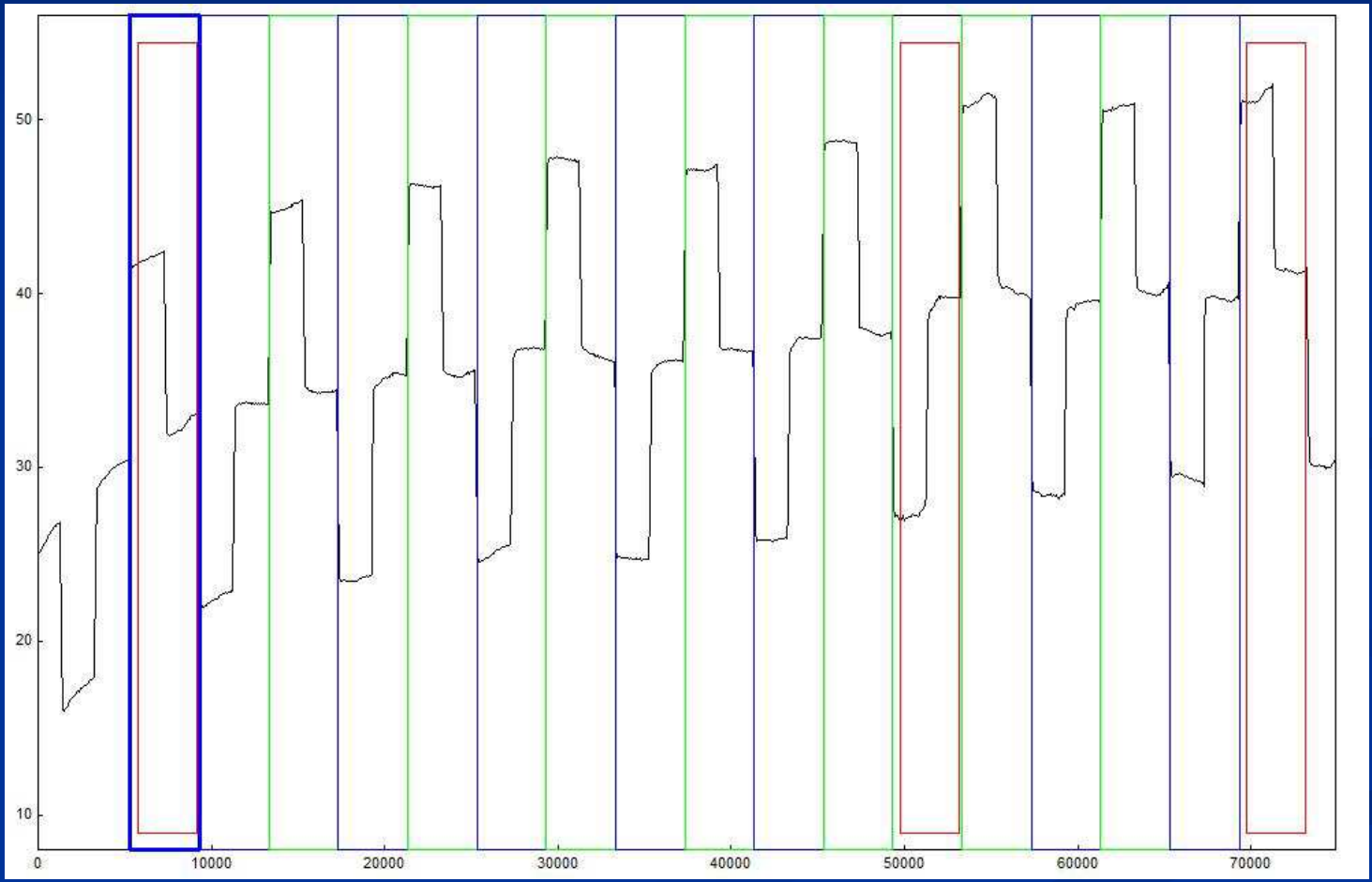
Good data quality

Time Domain IP Practice



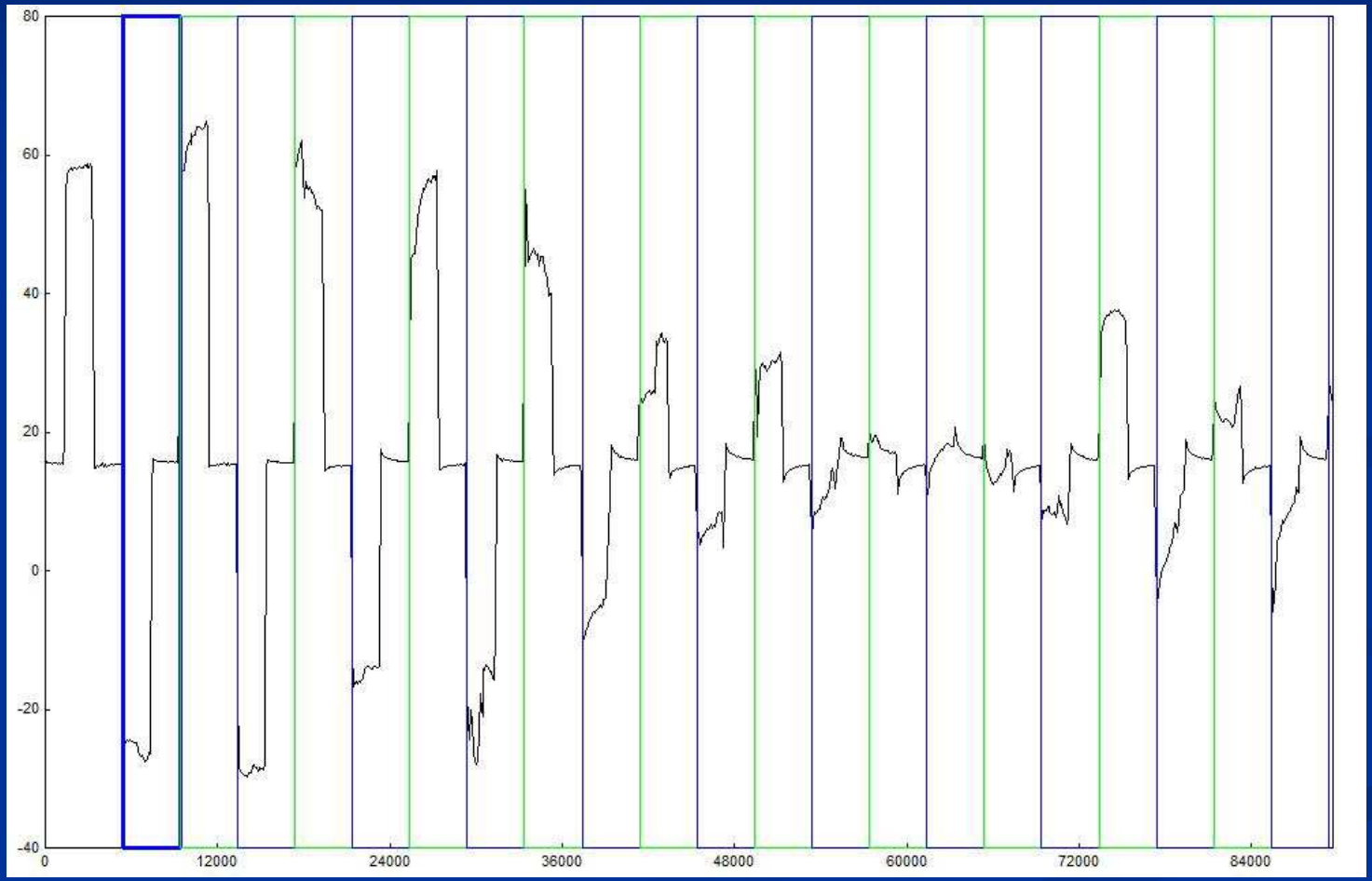
Reasonable data quality

Time Domain IP Practice



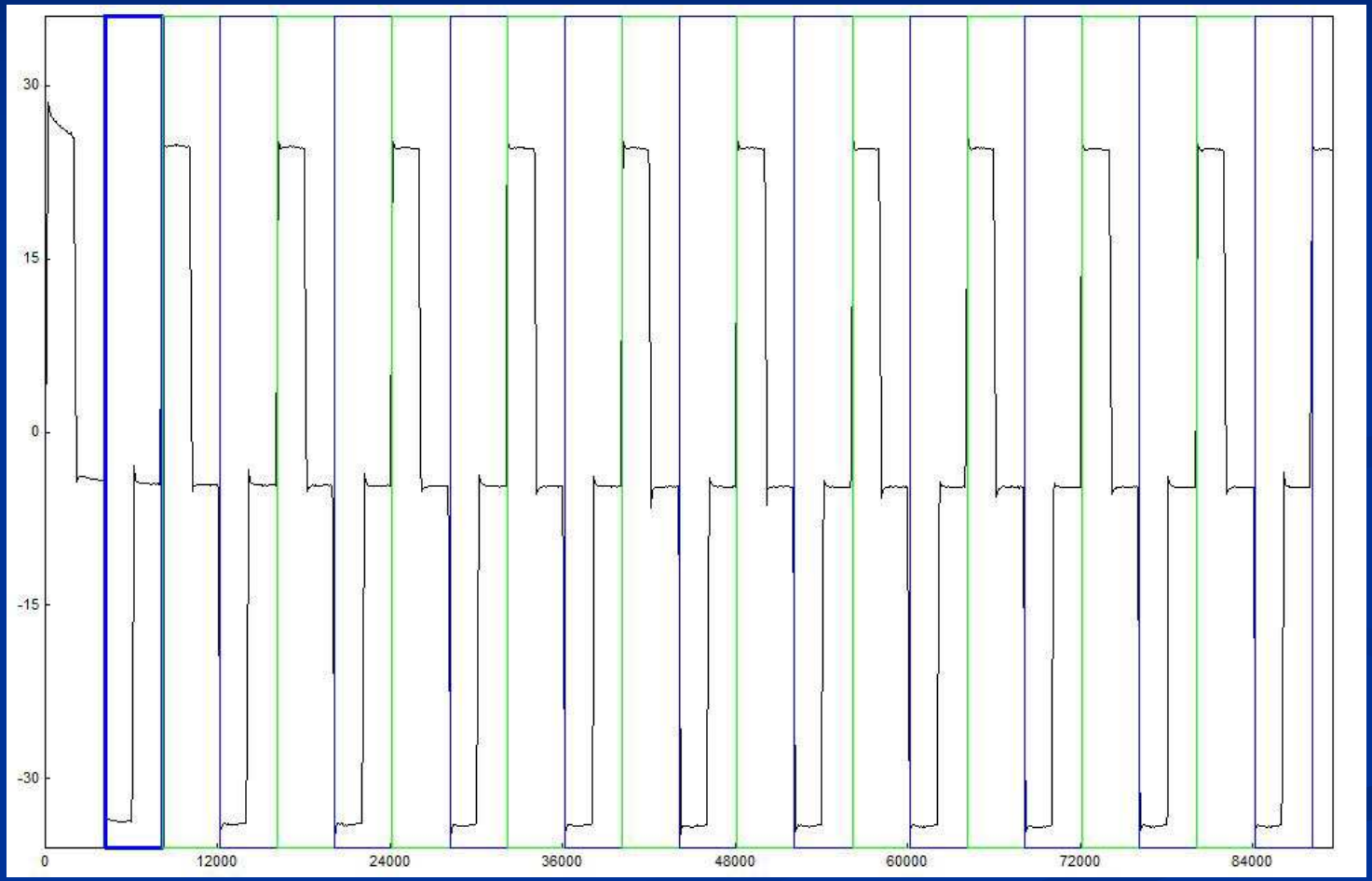
Poor data quality

Time Domain IP Practice



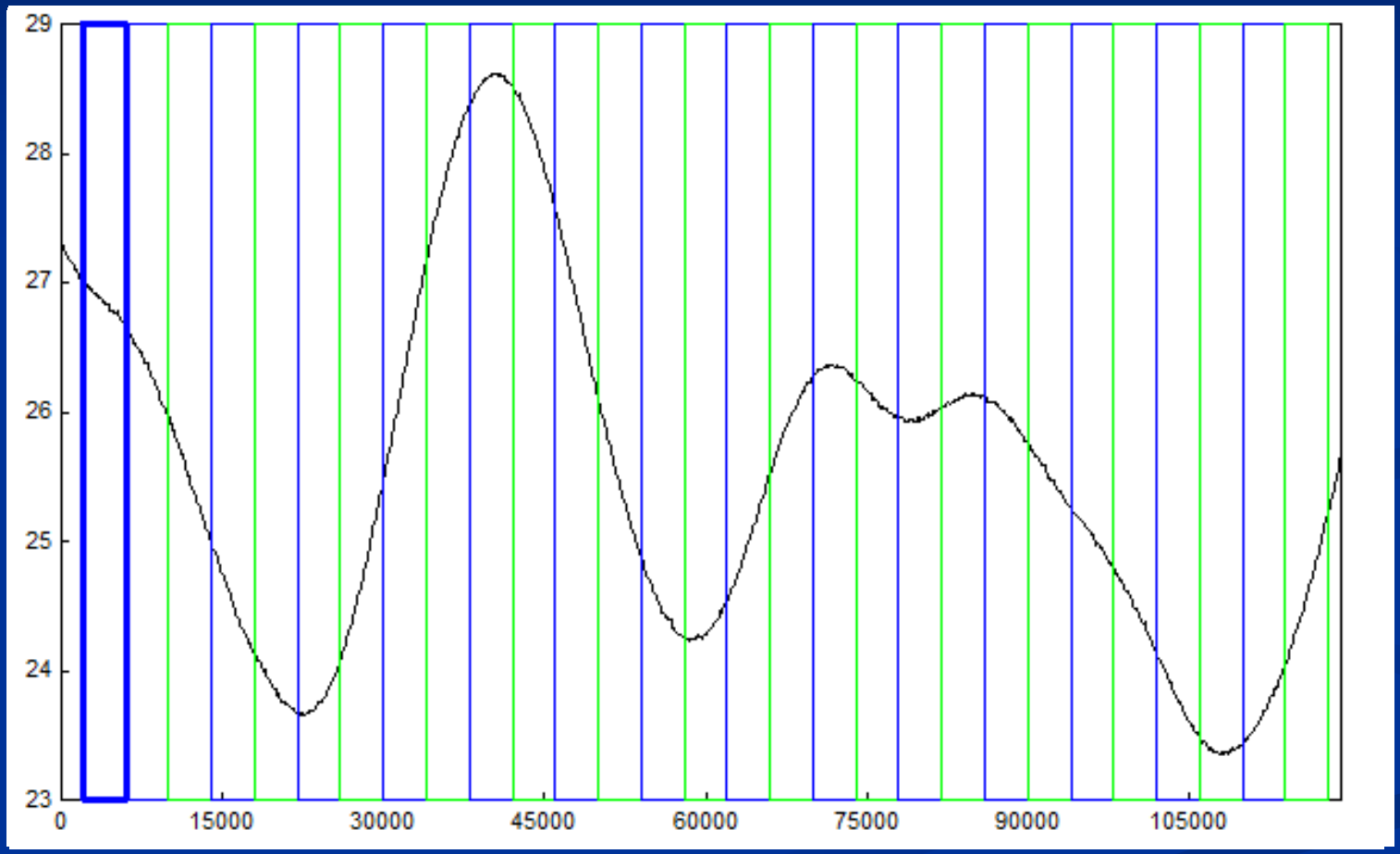
Very poor data quality

Time Domain IP Practice



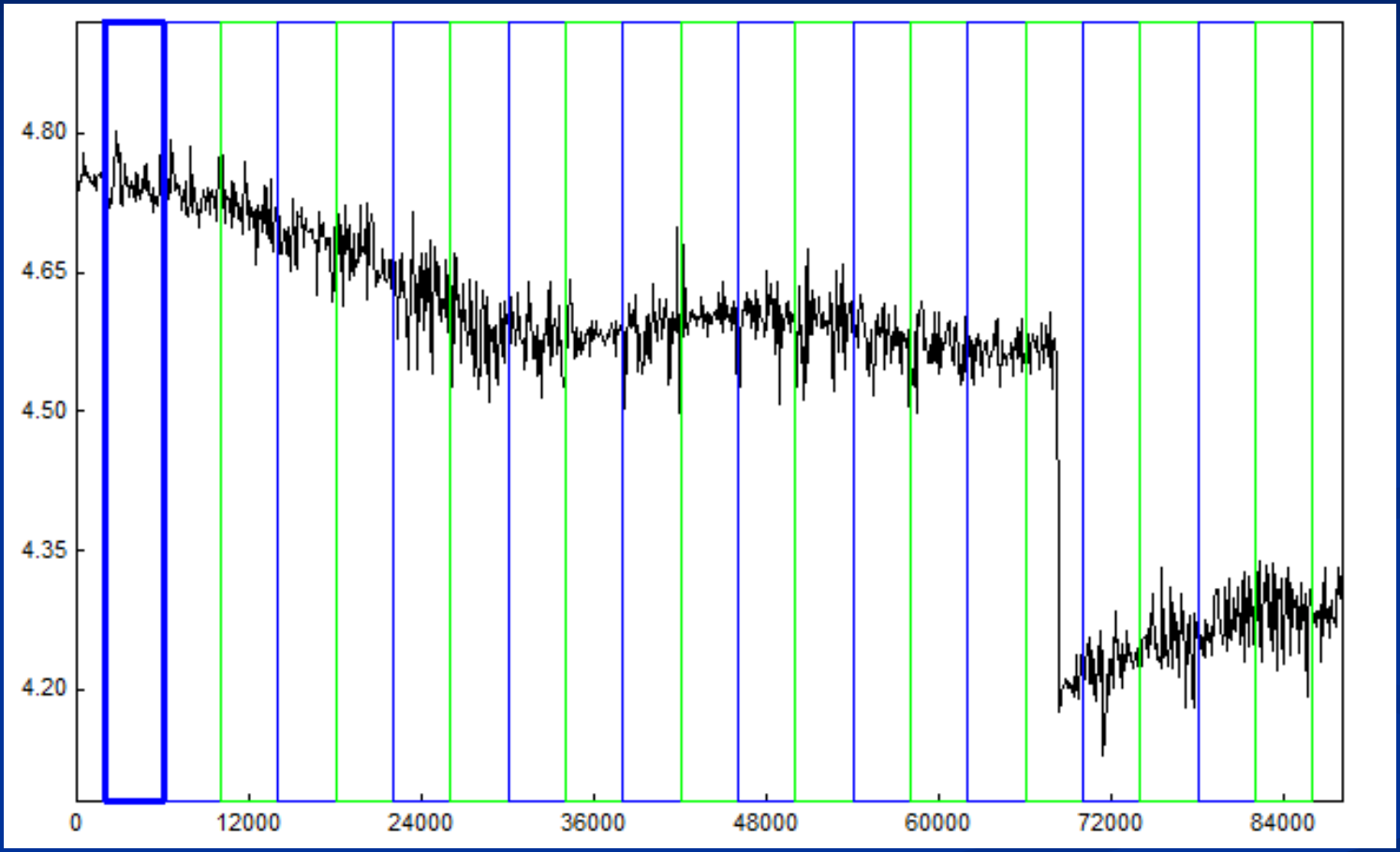
Very strong negative EM coupling

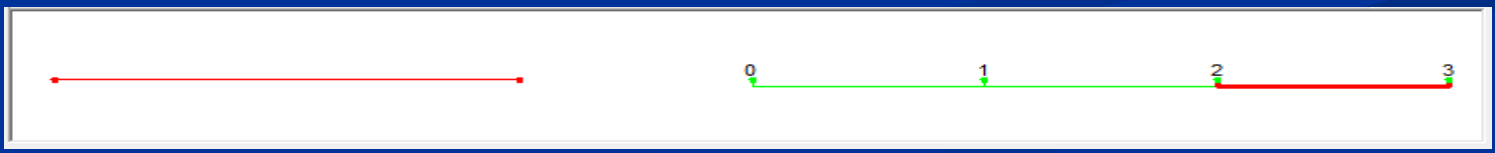
Time Domain IP Practice



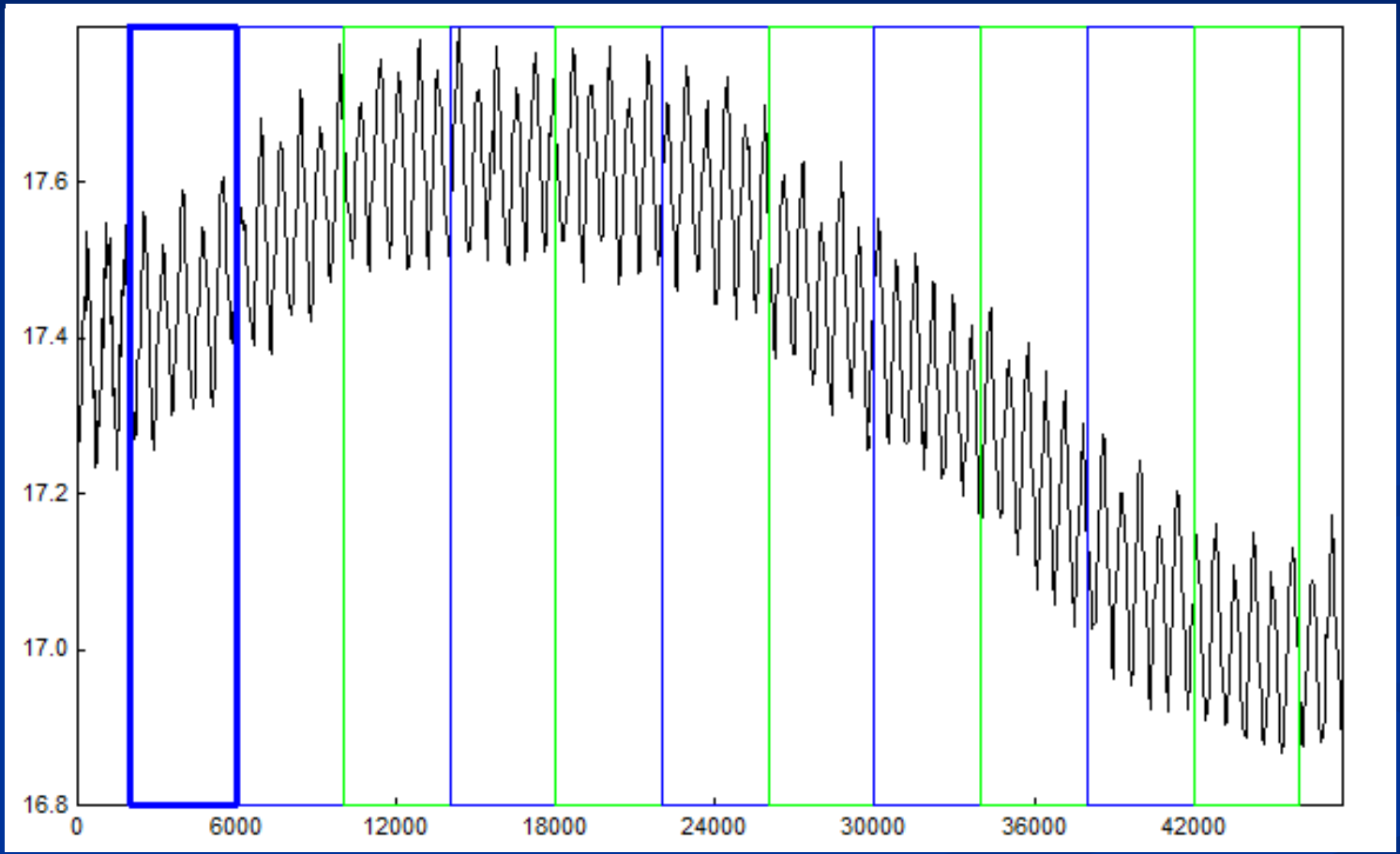
StrongTelluric

Time Domain IP Practice - Noise

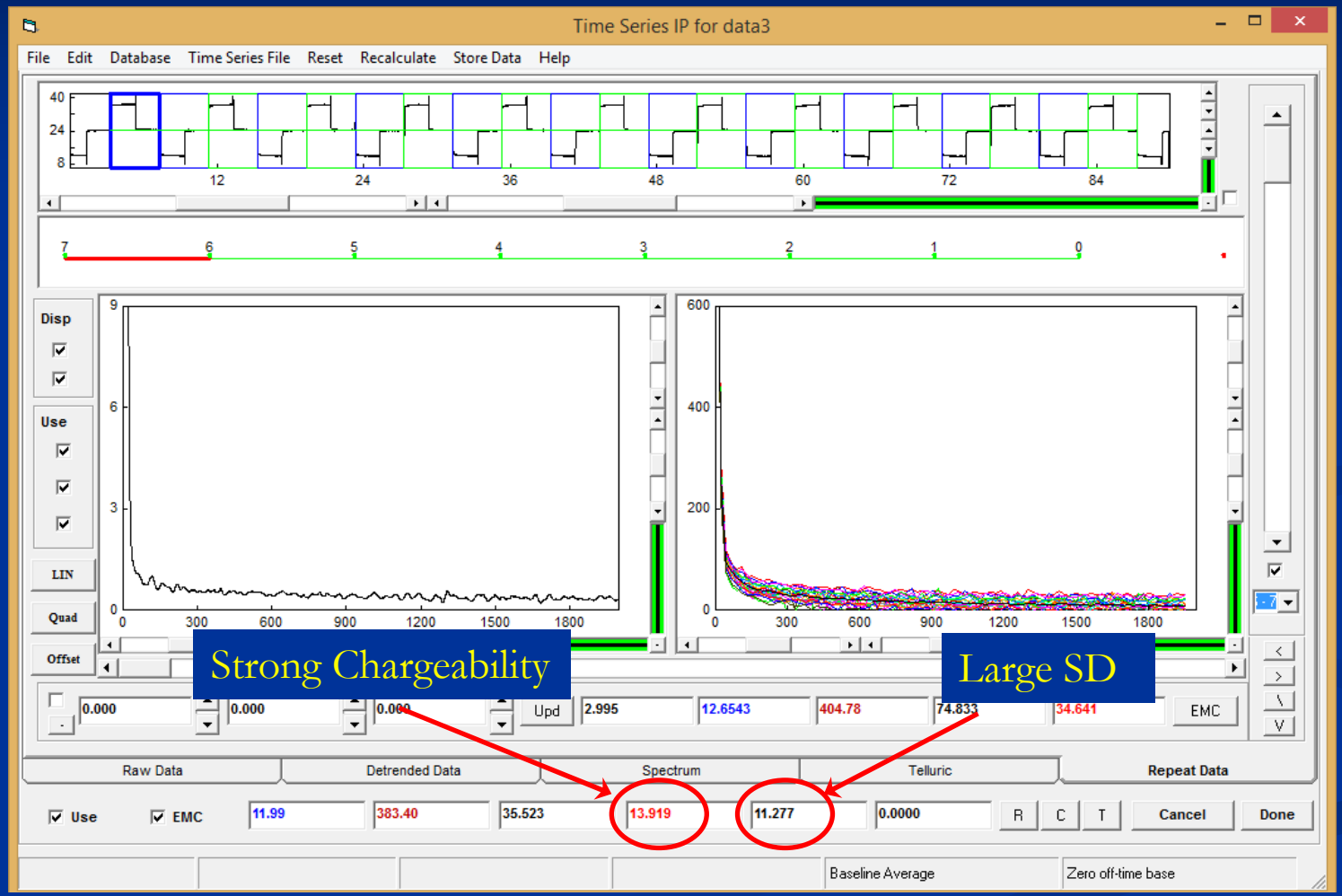




Time Domain IP Practice - Noise

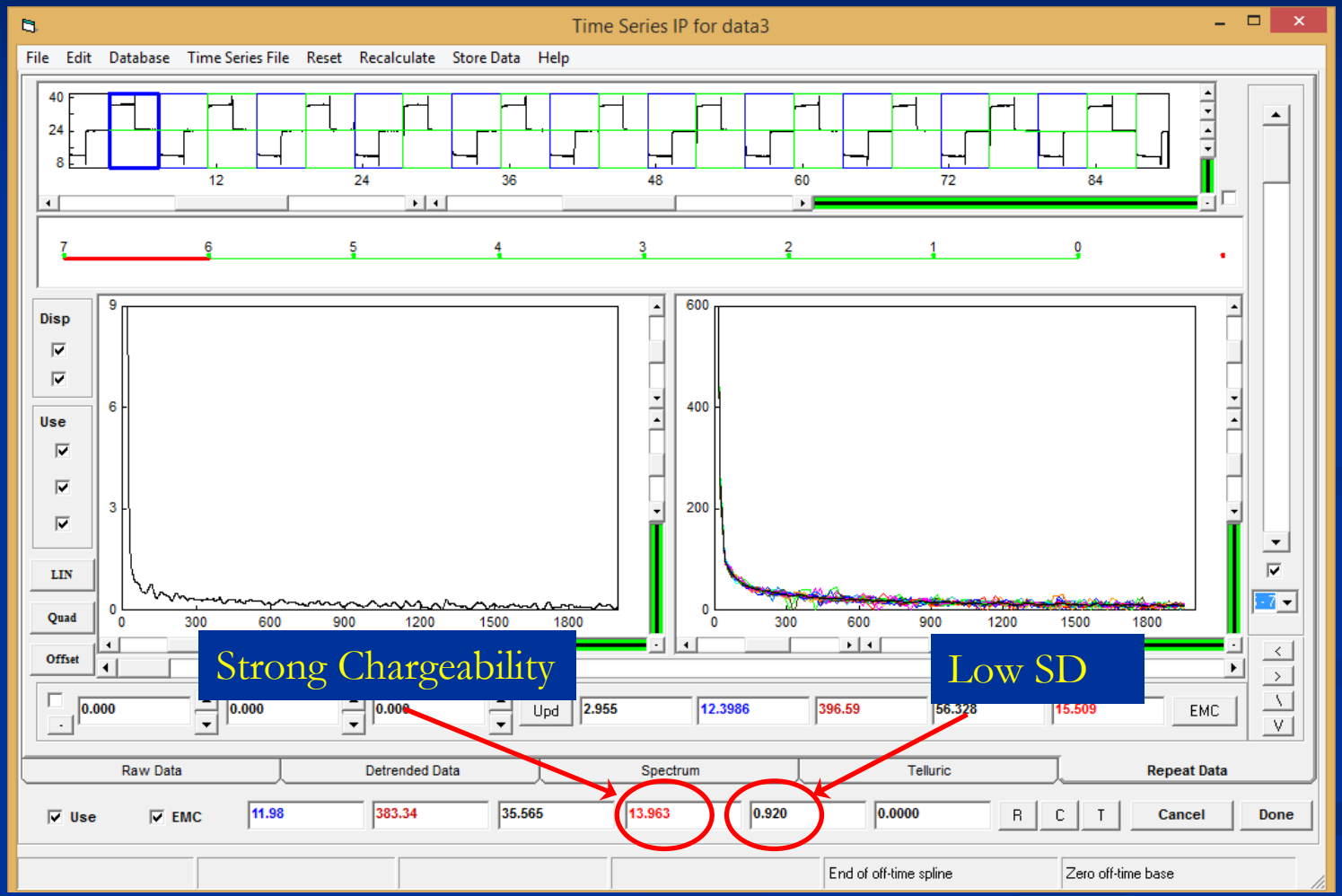


Telluric Processing



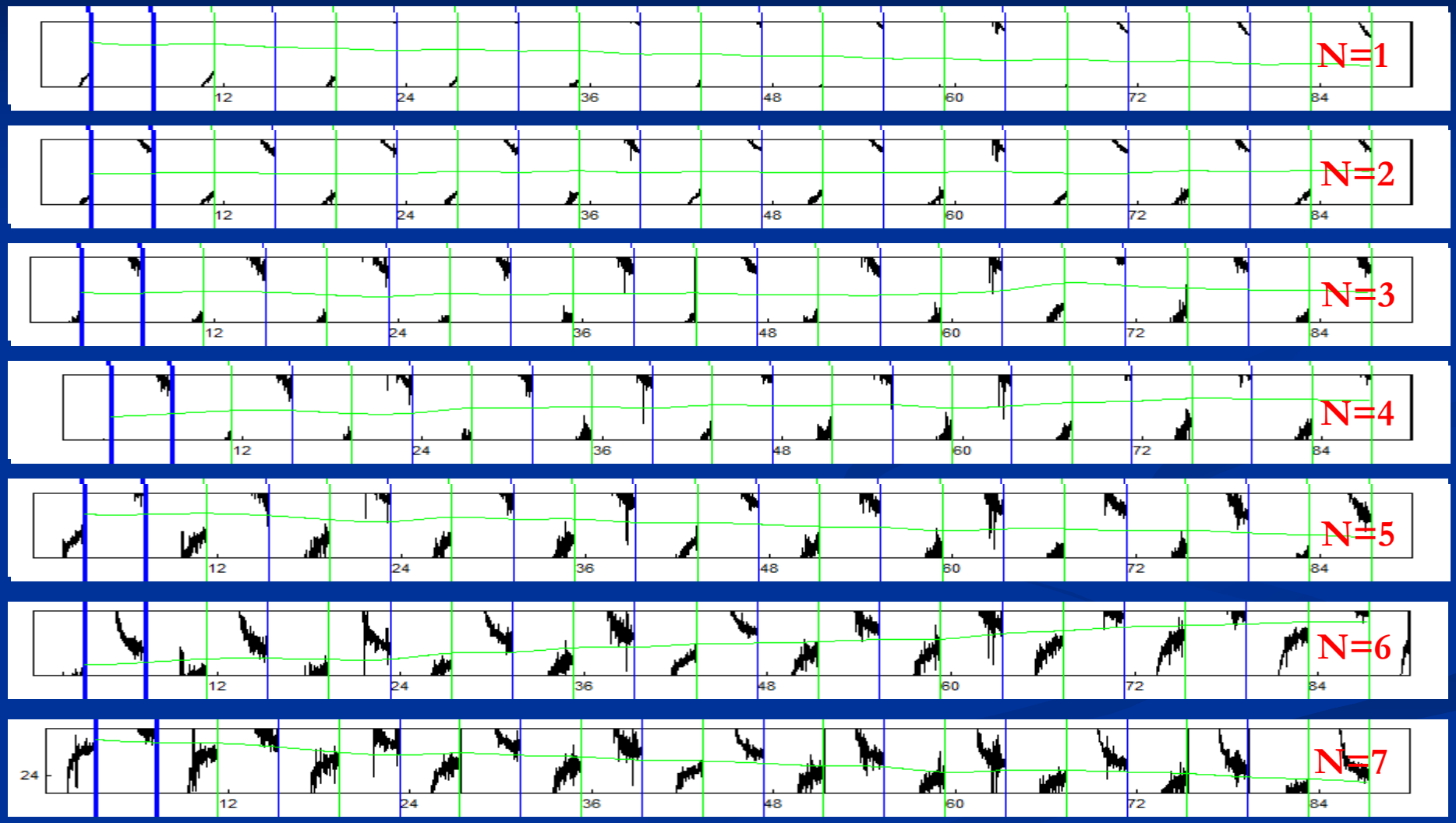
Standard processing

Telluric Processing



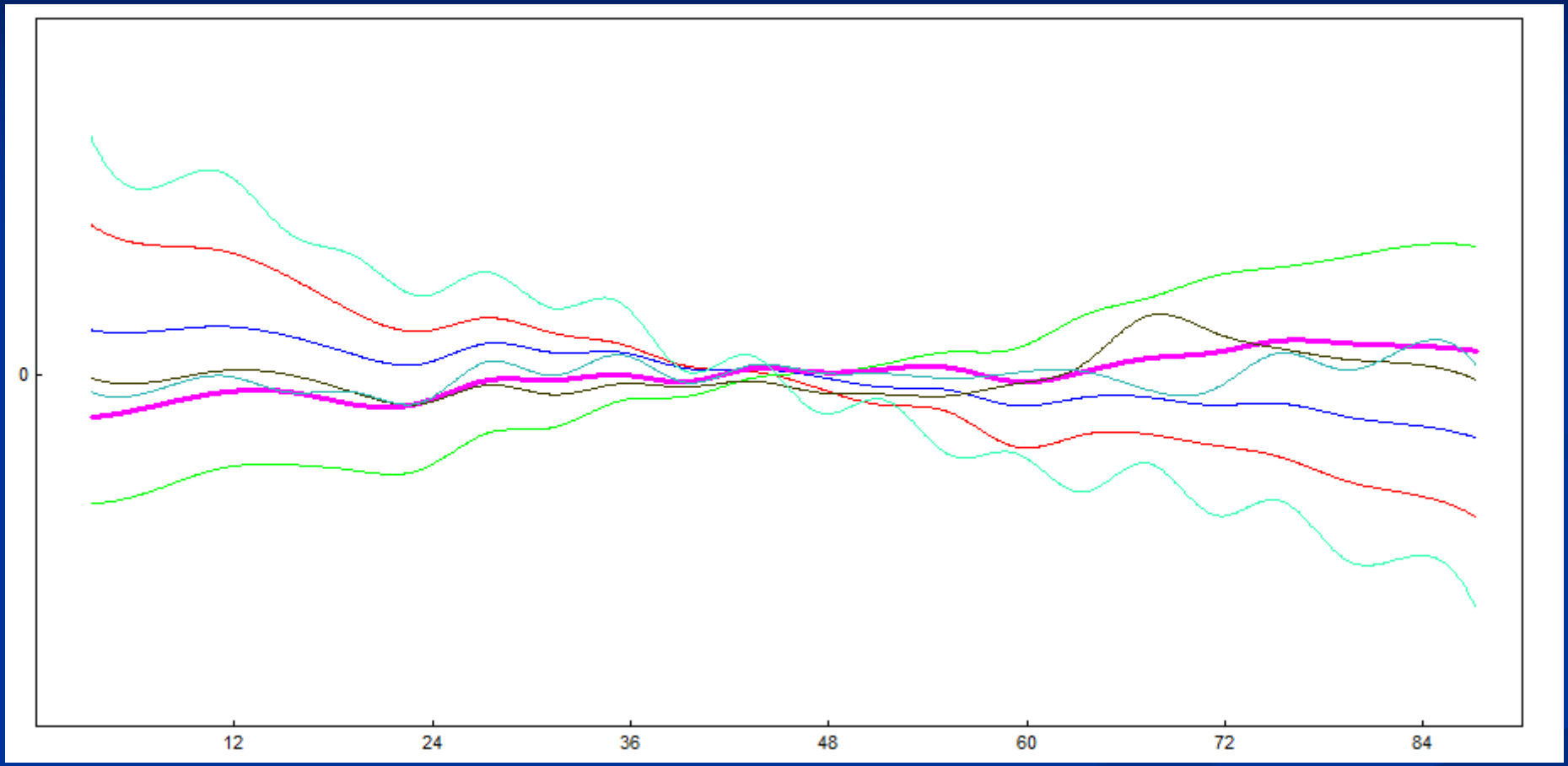
Telluric removal processing

Telluric Processing



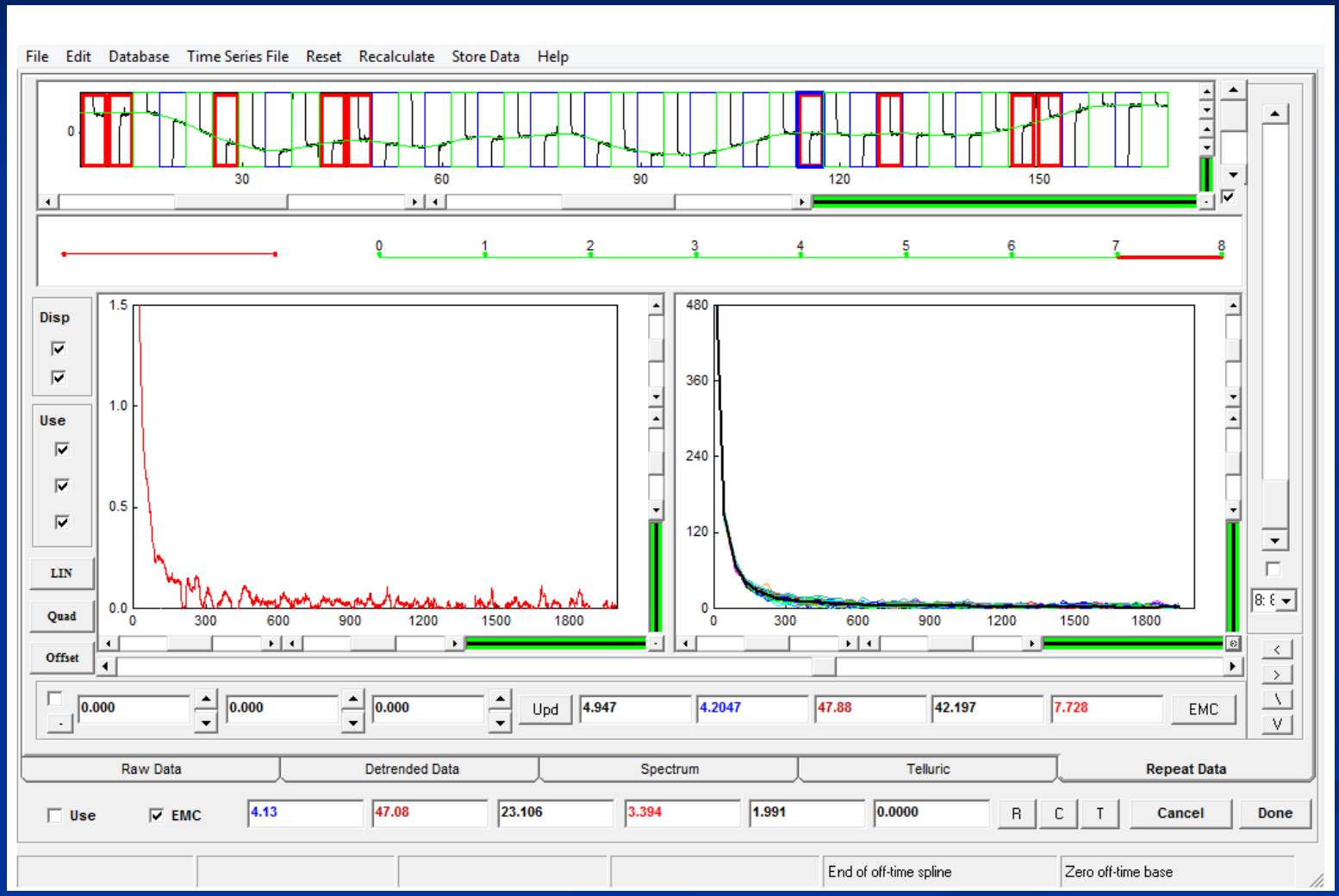
Telluric removal processing

Telluric Processing



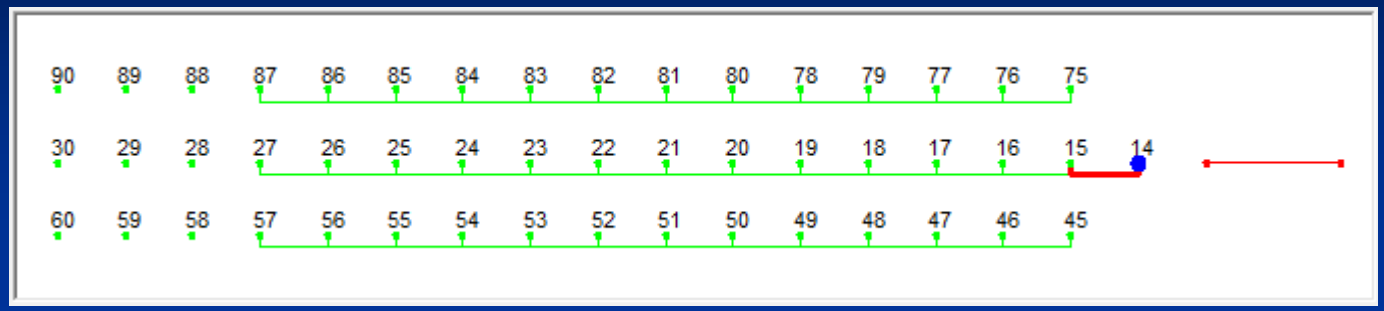
Telluric removal processing

Telluric Processing

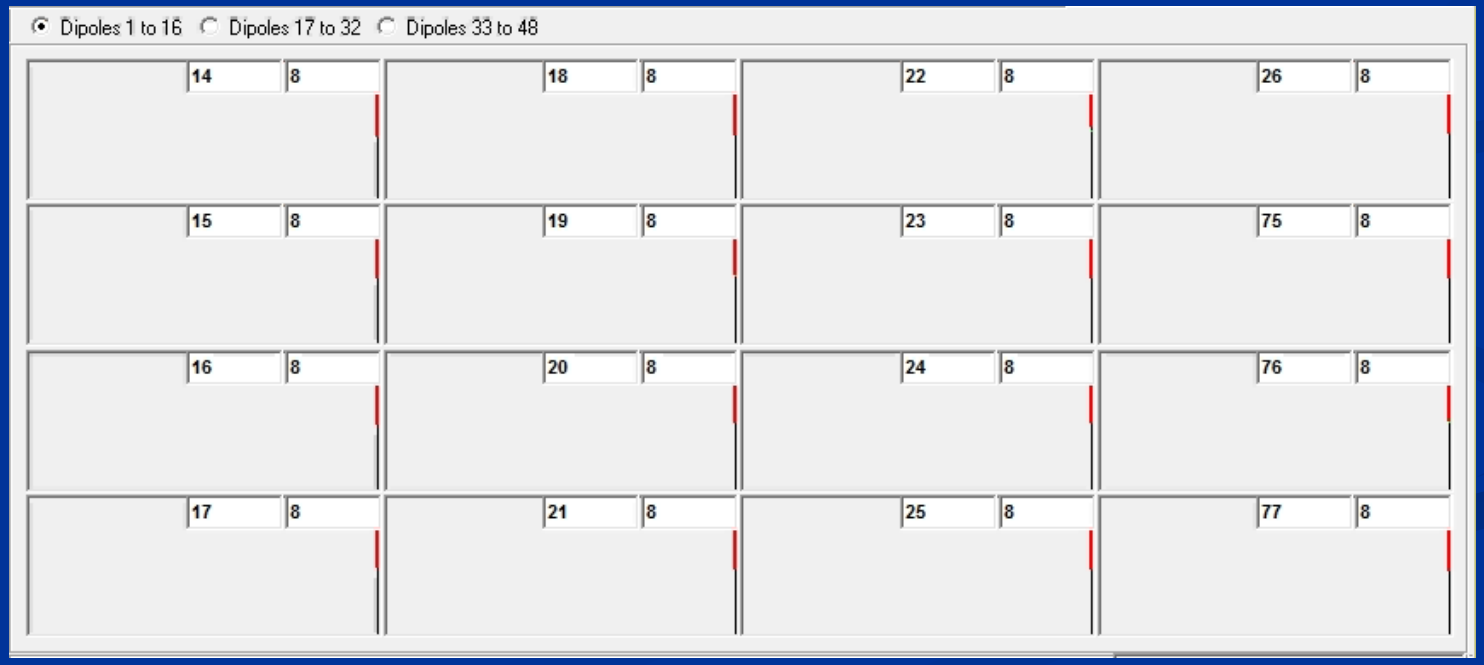


Bad cycles and Telluric removal processing

Fixing Field Problems

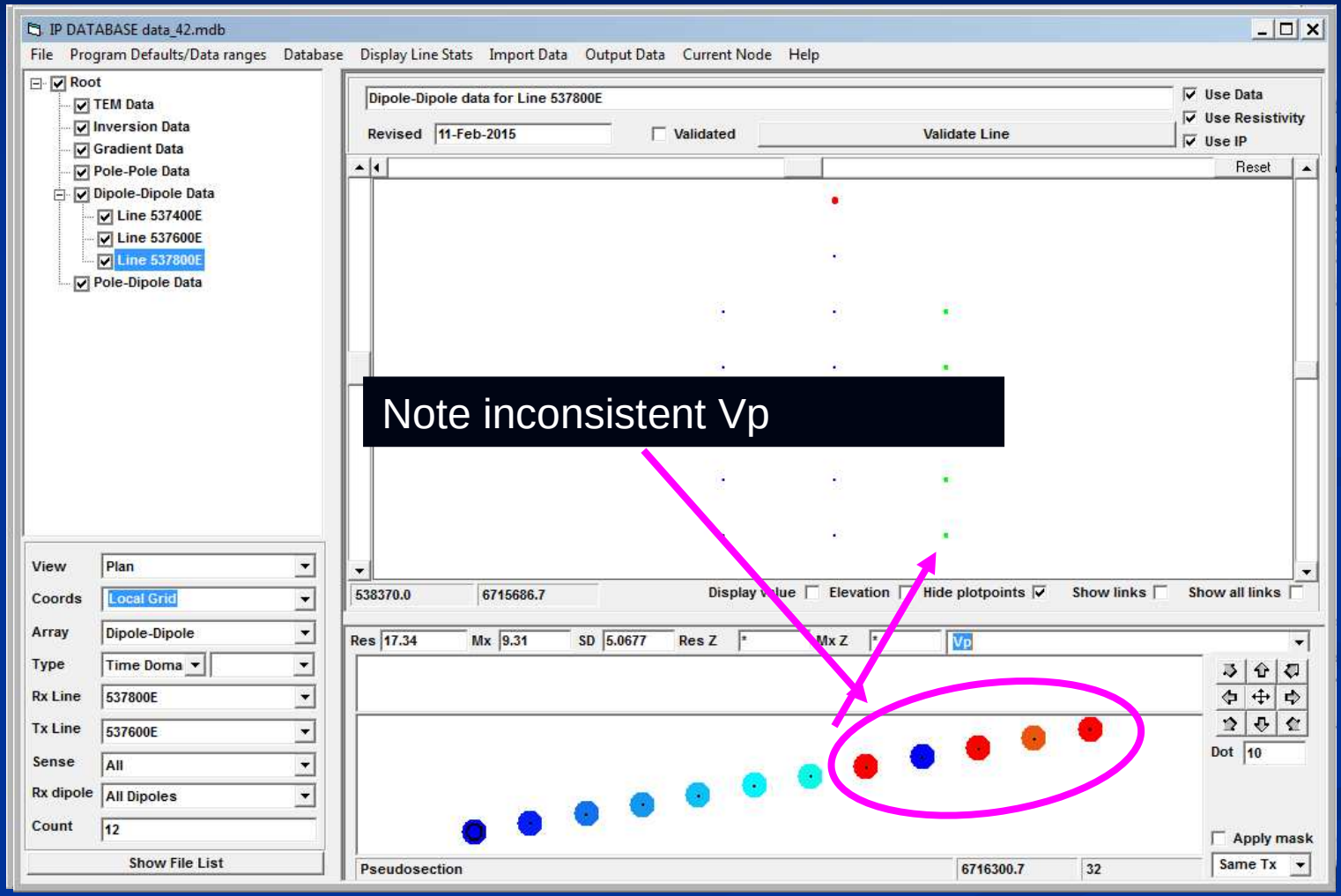


Electrode layout



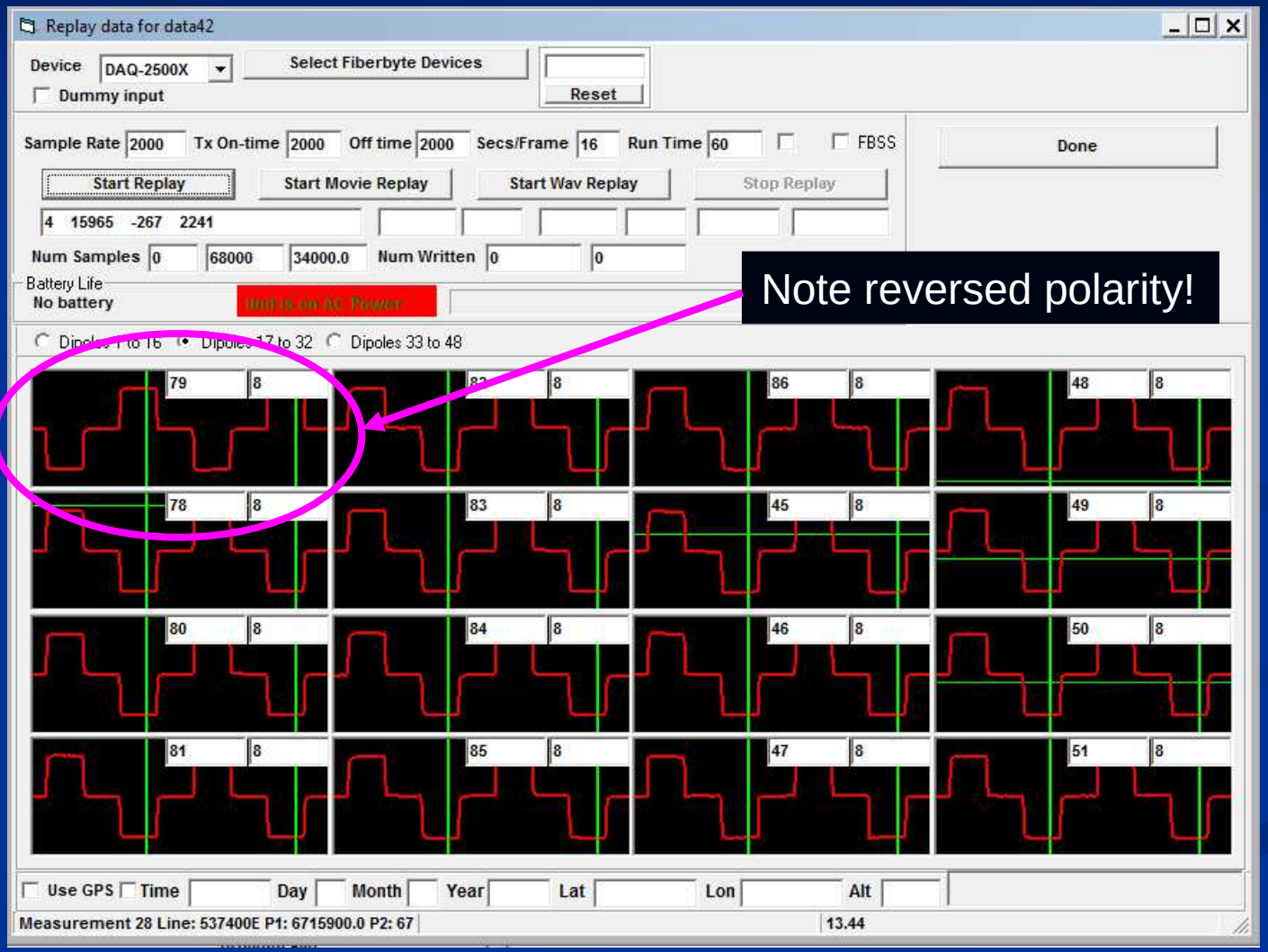
Data Collection

Fixing Field Problems

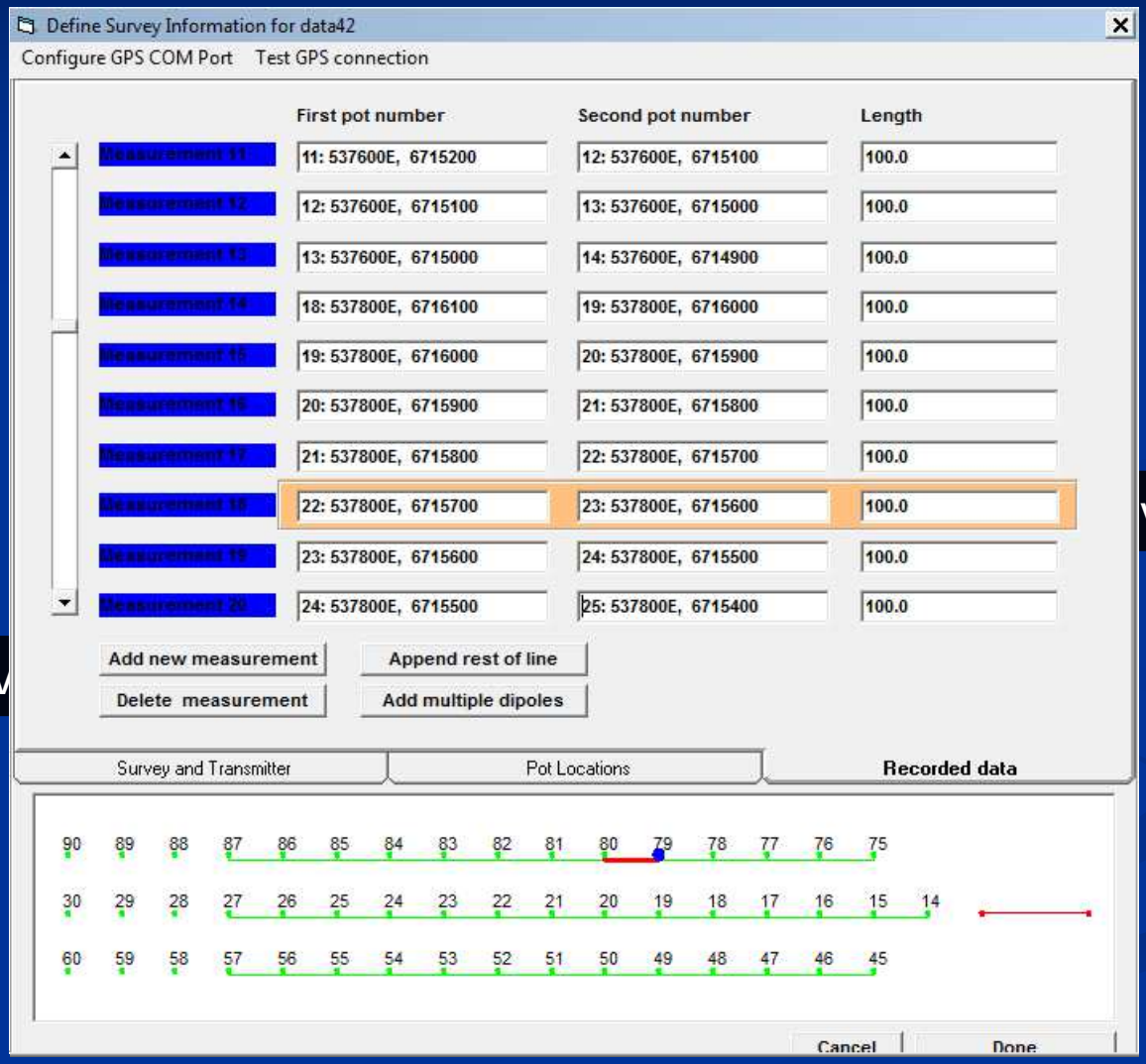


Processed Vp data

Fixing Field Problems



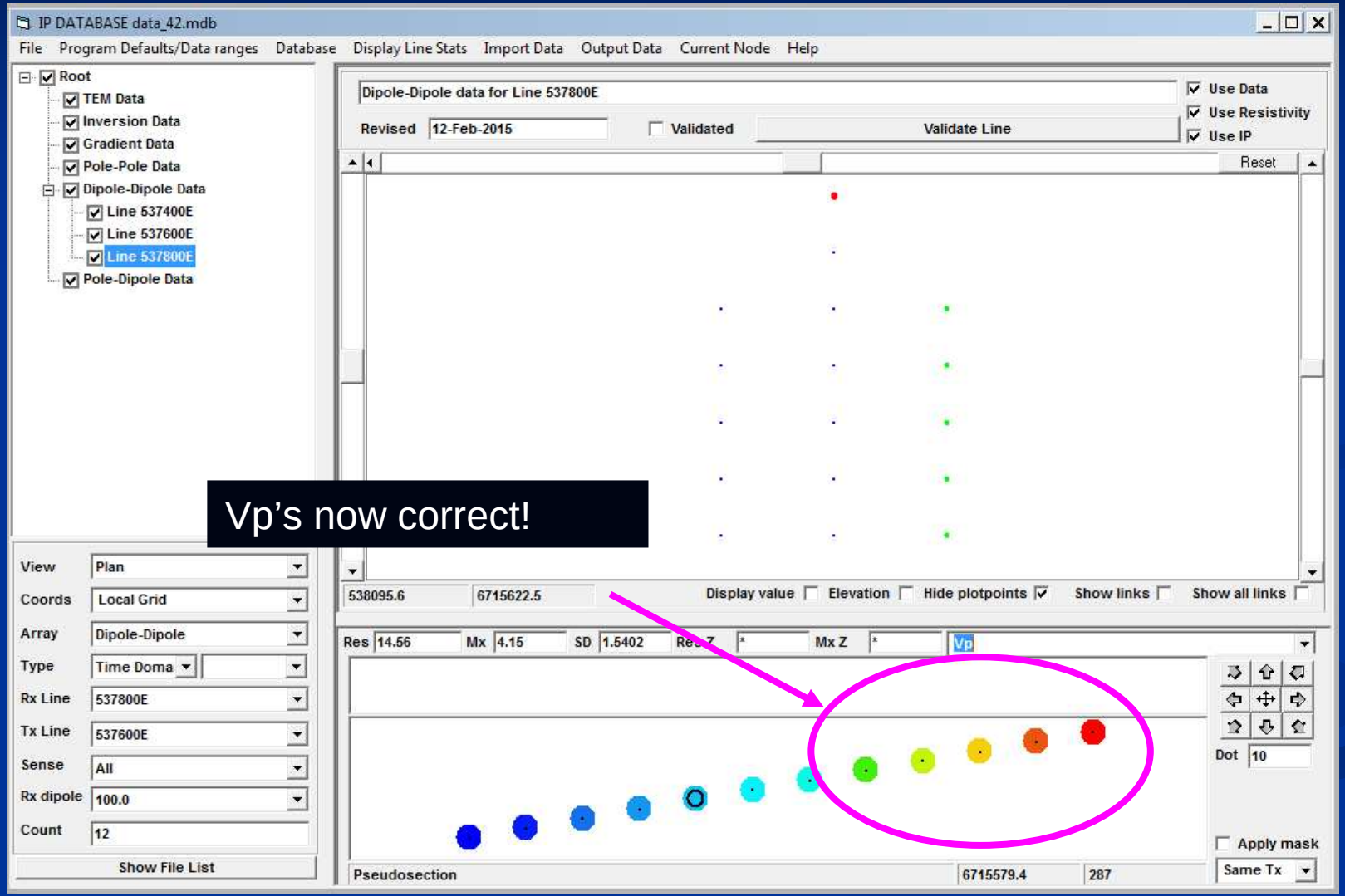
Fixing Field Problems



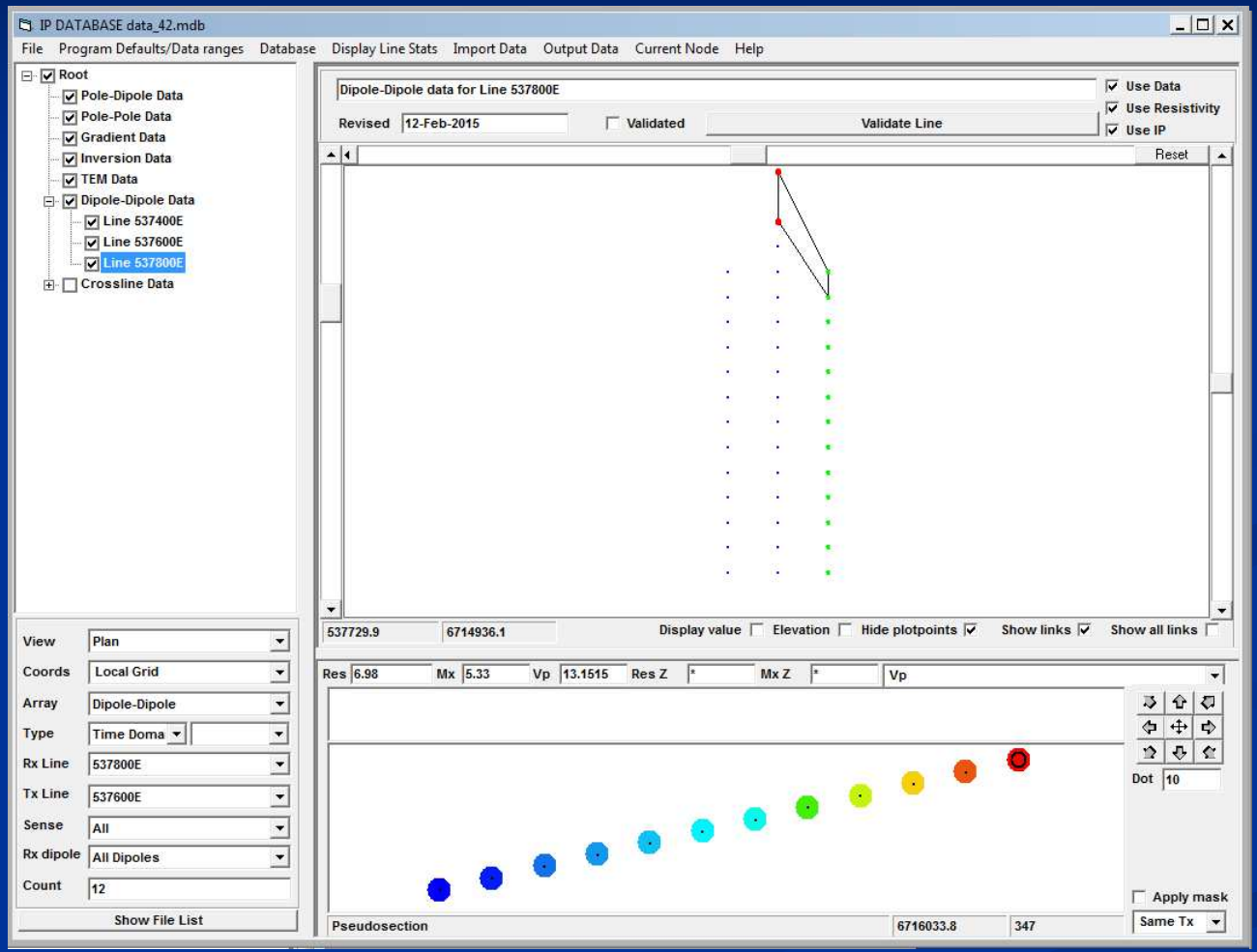
Note rev

versed stations!

Fixing Field Problems

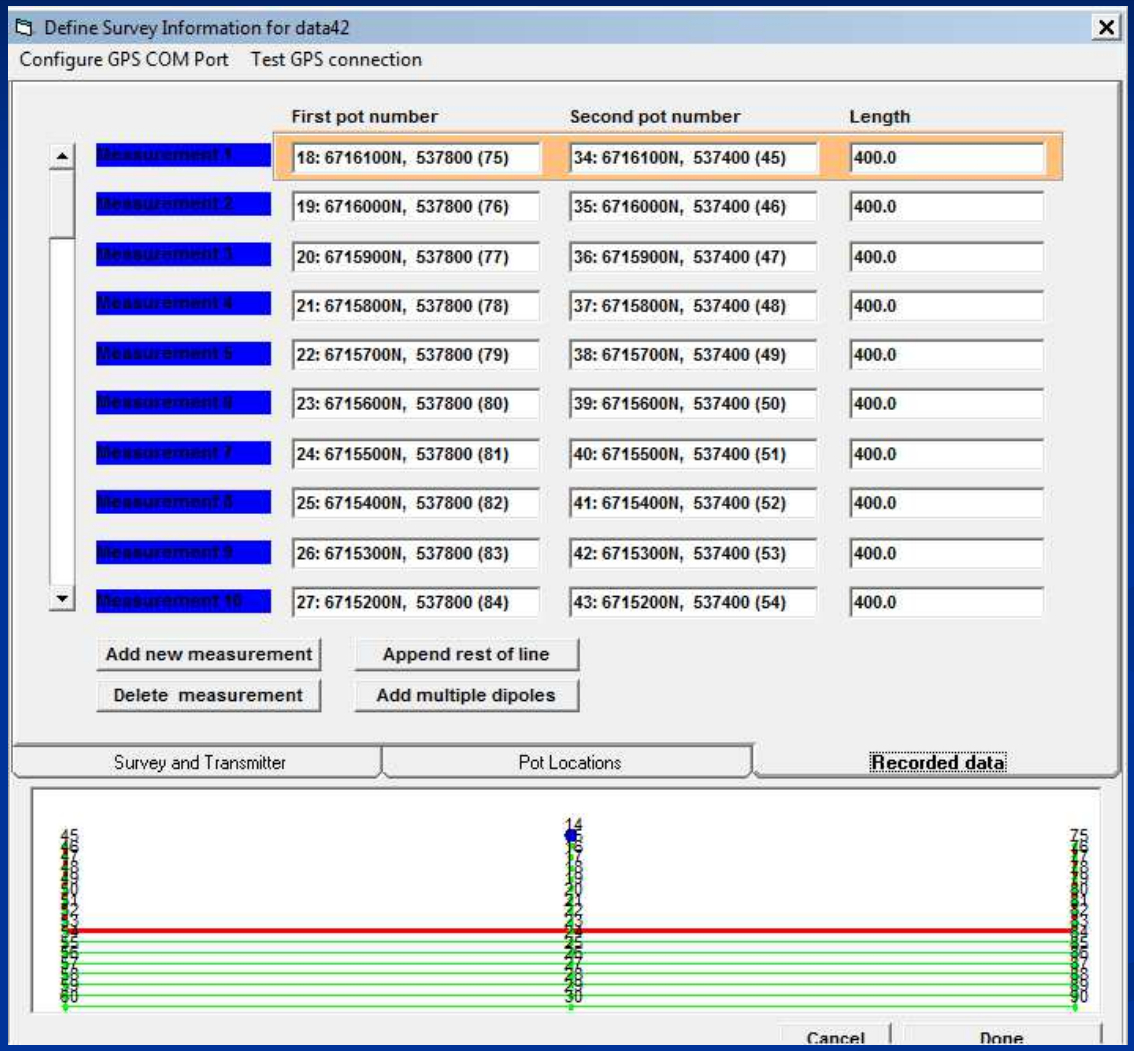


Calculating new measurements



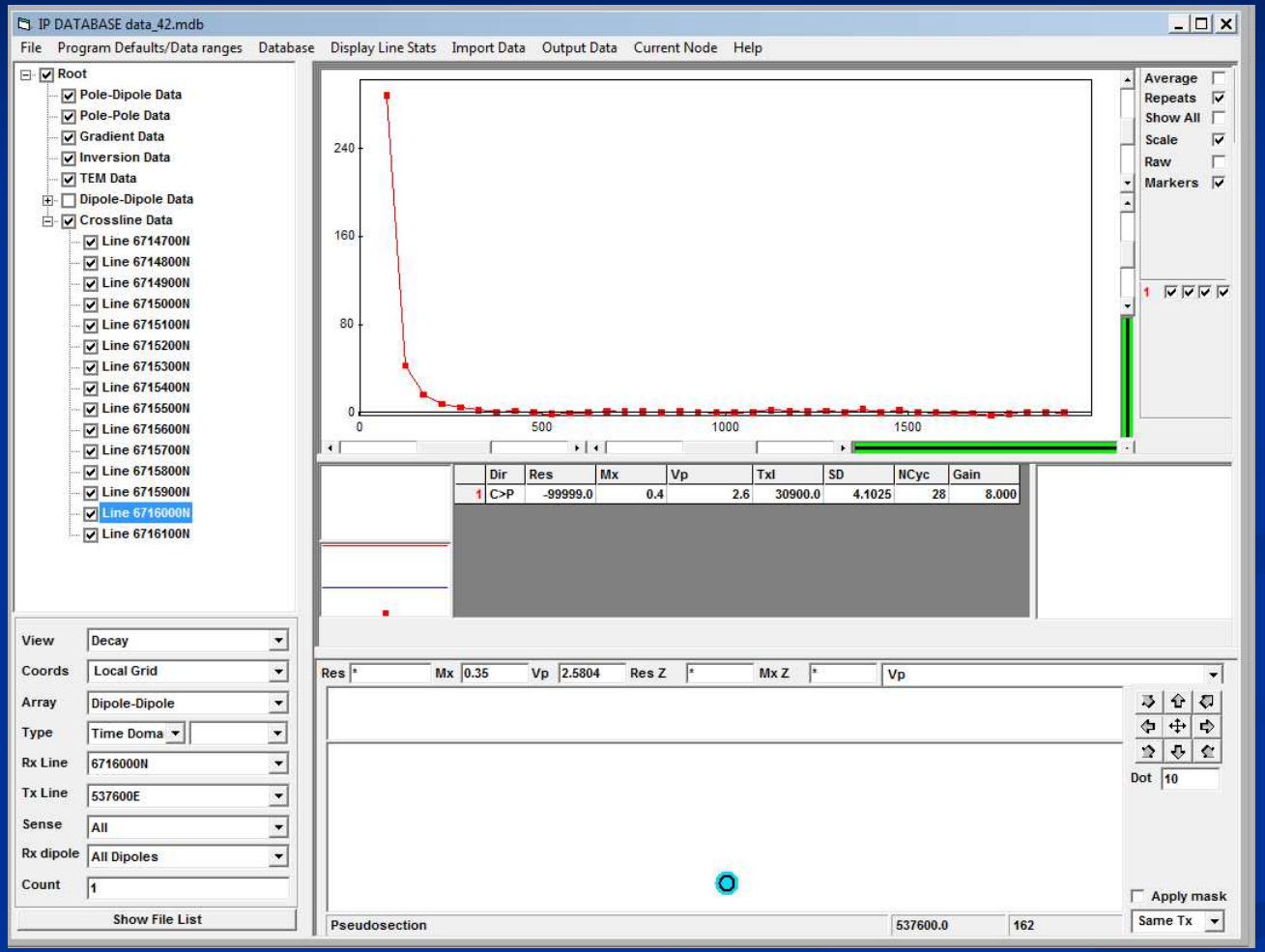
Normal Offset dipole measurements

Calculating new measurements



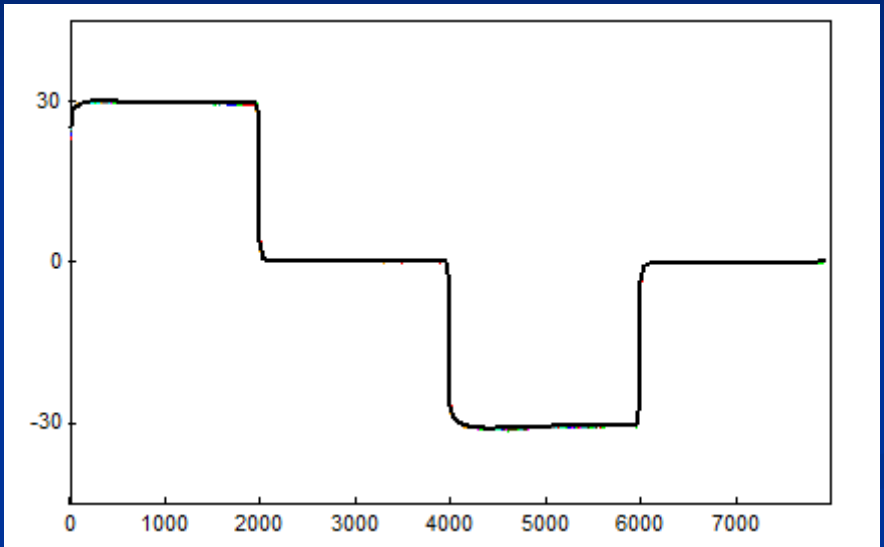
Define measurements to calculate cross-line dipoles

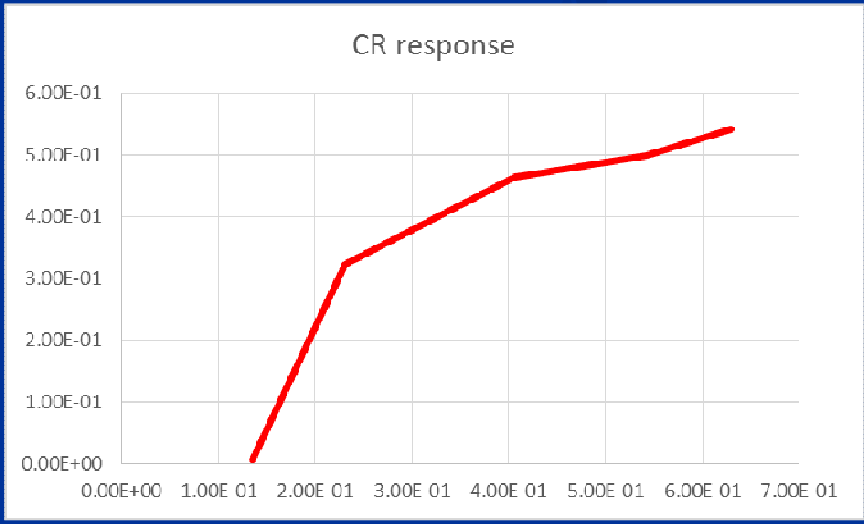
Calculating new measurements



Define measurements to calculate cross-line dipoles

Calculating new measurements CR





Conclusions

- Aids in collecting best possible data
- Helps detect and fix problems in the field
- Helps fix operator errors after data is collected
- Provides scope for improving data quality
- Allows new data processing methods to be applied to previously collected data