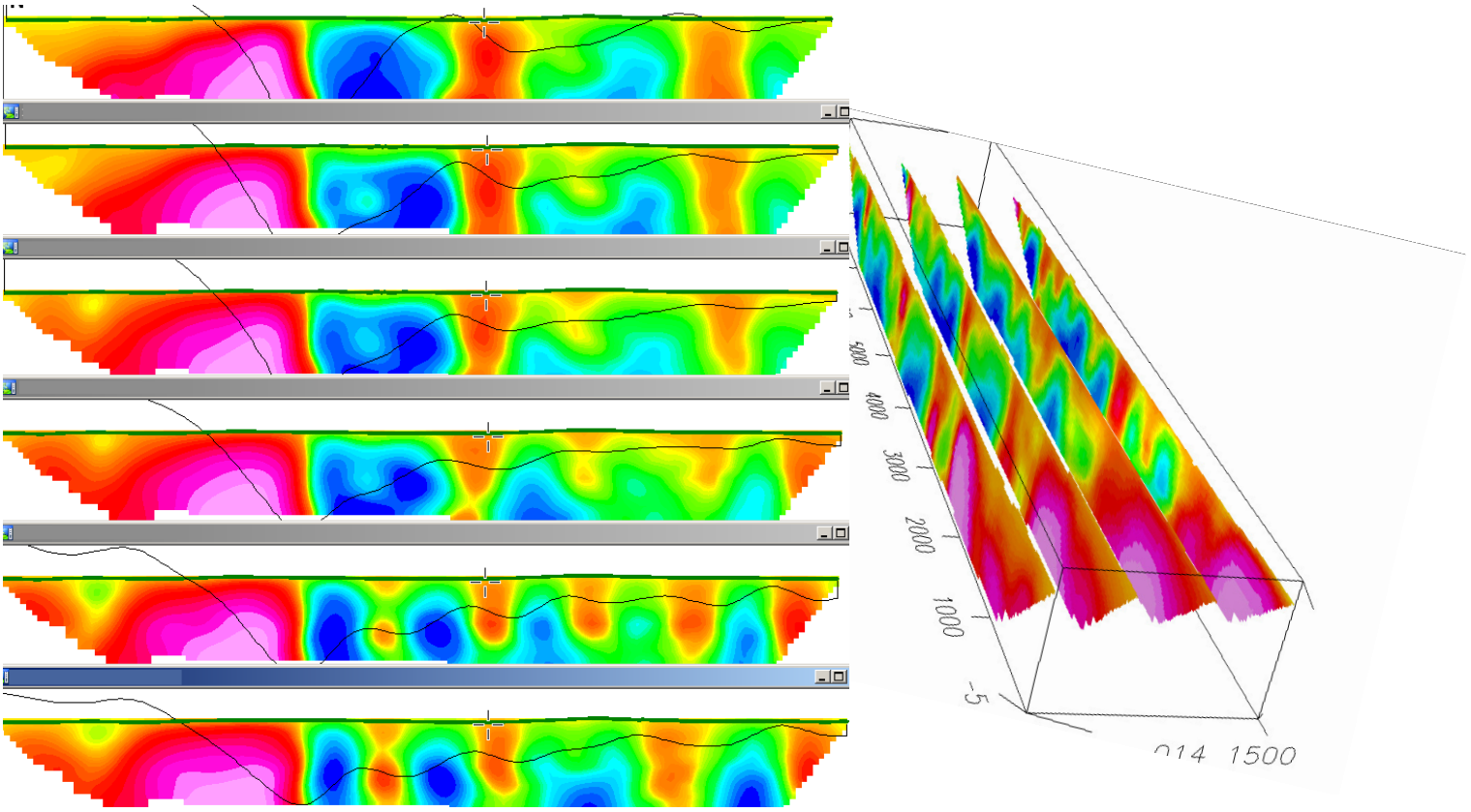
Current Density Depth Imaging (Karous-Hjelt filtering) CDDI.gx

(developed by Alexander Prikhodko)

The transformation is based on discrete linear filtering which converts crossovers of the current polarity into peaks by differencing of component values along the profiles. Karous and Hjelt (1977, 1983)[1] on base of Bio-Savart low describe the magnetic field arising from a subsurface 2D current distribution assumed in a thin horizontal sheet of varying current density, situated everywhere at a depth equal to the distance between the measurement stations. By calculating the inverse filter at various depths (e.g., Δx, 2Δx, 3Δx…), one can study the variation of "current densities" with depth.

The sections of "tipper" data (VLF for example) can be used for pictorial imaging and indication of the depth of the various "current" concentrations and spatial disposition of conductive subsurface geological features. The technique is effective for a simple scheme of semi-quantitative interpretation of EM-tipper data.



[1] 1. S-E.Hjelt, M.Karous: Determination of Apparent Current Density From VLF Measurements. Department of Geophysics University of Oulu, Contribution no.89, 19 p., 1977.
2. M. Karous and S.E. Hjelt, Linear filtering of VLF dip angle measurements, *Geophysical Prospecting* **31** (1983), pp. 782–794 .
3. R.D. Ogilvy and A.C. Lee, Interpretation of VLF-EM in-phase data using current density pseudosections, *Geophysical Prospecting* **39** (1991), pp. 567–580