



Colinear null arrays in geoelectrics

S. Szalai (1), L. Szarka (1), G., Marquis (2), P. Sailhac (2), P. Kaikkonen (3), I. Lahti (3)

(1) Geodetic and Geophysical Research Institute of the Hungarian Academy of Sciences, Hungary, Sopron (szalai@ggki.hu, szarka@ggki.hu) (2) Louis Pasteur University, France, Strasbourg, (Guy.Marquis@eost.u_strasbg.fr, Pascal.Sailhac@eost.u_strasbg.fr) (3) University of Oulu, Finland (Pertti.Kaikkonen@oulu.fi, Ilkka.Lahti@oulu.fi)

The term „geoelectric null-array” is used for those D.C. electrode configurations, where the measured or the interpreted potential difference is zero above a homogeneous halfspace. Szalai et al (2002) applied successfully geoelectric null-arrays, namely the Schlumberger-, the three-electrode, and the dipole axial null arrays to localise fractures and to determine their direction in limestone. Nevertheless these arrays have some limitations which could be eliminated using colinear null arrays. Colinear null arrays (1) can be applied not only in case of 3D inhomogeneities, (2) their field setup is simple, (3) they can be automatically used in multielectrode systems.

Parameter sensitivity maps, numerical studies and field tests demonstrate the usefulness of the chosen midpoint and Wenner- γ quasi-null arrays. This work serves also as a basis for a comparison of D.C.- and electromagnetic null arrays, like e.g. the VLF array.

References

Szalai, S., Szarka, L., Prácser, E., Bosch, F., Müller, I., Turberg, P. (2002): Geoelectric mapping of near-surface karstic features by using null-arrays. *Geophysics*, 67, 1769-1778.