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Combination of a flexible electrode optimizer with a new forward modeling technique in 3D survey

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SUMMARY

In this research a flexible electrode array's combination device is used for 2D/3D resistivity data acquisition. This system can be used for applying any possible array over a survey electrode network with no restriction on the array size in any direction. Despite similar systems which are limited in size of network and possibility of electrode configuration, this system can be used in a large scale 2D or 3D acquisition.
It not only enables acquiring a large collection of data, but also gives the ability to apply optimized electrode array in spite of other similar systems, hence it is suitable for 2D or 3D data acquisition. The data sets acquired with this device can be planned and used in optimized electrode array design. This can give better resolution while the data set inversion process. This equipment affects data interpretation with increasing of captured data quantity in which directly impact the interpretation quality.
Electrode array design can be chosen prior to the actual survey and with this equipment, it will be a full automated process. Another option is to let device decides and modify survey steps based on acquired survey acquisition.
To achieve this task effectively, the noble modeling technique is used with combination with a K-factor engine. As this new method has no singularity problem to solve a resistivity network, and it uses parallel programming technique to improve processing time, it makes it the best choice for forward modeling engine in the flexible electrode array's device.

Key words: Geophysics, Geoelectric, Resistivity, Forward modeling, Optimization