



## **ELRIS2D: A MATLAB Package for the 2D Inversion of DC Resistivity/IP Data**

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### **A b s t r a c t**

ELRIS2D is an open source code written in MATLAB for the two-dimensional inversion of direct current resistivity (DCR) and time domain induced polarization (IP) data. The user interface of the program is designed for functionality and ease of use. All available settings of the program can be reached from the main window. The subsurface is discretized using a hybrid mesh generated by the combination of structured and unstructured meshes, which reduces the computational cost of the whole inversion procedure. The inversion routine is based on the smoothness constrained least squares method. In order to verify the program, responses of two test models and field data sets were inverted. The models inverted from the synthetic data sets are consistent with the original test models in both DC resistivity and IP cases. A field data set acquired in an archaeological site is also used for the verification of outcomes of the program in comparison with the excavation results.

**Key words:** 2D inversion, GUI, finite elements, hybrid mesh.