Groundwater drainage monitoring and karst terrain analysis using Spontaneous Potential (SP) in Anina Mining Area (Banat Mountains, Romania). Preliminary study.

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STATE OF THE ART
The Spontaneous Potential (SP) method is the method that can offer information regarding the geometry and the dynamics, simultaneously, of ground water flow in real time (Jardani et al. 2007b, 2008).

Based on the flow of ground water, there is resulting a natural electrical potential. This natural electrical potential is directly related to the movement of water within the aquifer (Jardani et al. 2009).
- Different types of limestone and marl
- The presence of clays and non-carbonated materials (granite, gravel, sandstones)
- The alternation of karst plateaus separated by deep valleys, giving the region representativeness of suspended karst plateaus.
- There are also blind valleys, and the other side is represented by many caves, springs, potholes, and karrens. On the other side, sinkholes, uvalas, poljes, and karrens are represented.
METHODOLOGY

1. Each electrode was placed inside a hole.
2. After 1 minute we noted the value indicated on the voltmeter (in mV).
3. Then we moved the mobile electrode.
4. The distance between the electrodes was 3 m, or if the area was larger, we took 5 m distance between electrodes.
5. Profiles with N-S and E-W orientations and also grids.
RESULTS AND DISCUSSIONS

Mărghitaş Plateau study case - SINKHOLE 1

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NOVEMBER 2013
RESULTS AND DISCUSSIONS

Mărghitaș Plateau study case - SINKHOLE 2
CONCLUSIONS

✓ There are sinkholes with a direction in water flow.
✓ Karstic depressions where we observe the SP values points out a stagnate tendency in the middle of them.
✓ Water drainage is influenced by the slope, by tectonic features and by sinkholes morphology.
✓ There are micro fissures that are growing the level of dissolution, based on SP measurements.
✓ We were able to ascertain that the SP measurements confirm that the main tectonic orientation, NW–SE is decisive in the water drainage.
✓ In our future work we intend to obtain more field data using spontaneous potential to compare with our first results.
✓ We intend to integrate in our analysis some other geophysical methods such as Ground Penetrating Radar and Electrical Resistivity Imaging.
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