Large subsurface hollows revealed by means of Electrical Resistivity Tomography: the case of Mt. Armetta Karst area, Italy

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Abstract

In this work we show the results of a resistivity tomography performed over the shallow part of a large cave system in the Mt. Armetta karst, Pennavaira valley northwestern Italy. The cave has been explored and surveyed by the authors themselves, thus a precise knowledge of size and shape of the subsurface voids is available. The cave, whose shallowest part exhibits narrow passages and large chambers, was developed in the Mesozoic sedimentary cover (Caprauna Armetta tectonic unit), an allochtonous nappe characterized by four deformation phases.

The main target of the experiment is a region located at about 30 m below surface precisely spotted by five 235m long ERT sections.

Since cave develops in a windy summit area, the long-term stability of an eolic power plant tower, located over a karst void, is also considered. As a matter of fact, the footings of the eolic towers (∼100 m high) may interfere with unpredictable shallow hollows, whose presence, in the power plant area, is more than likely.