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Identification of Karstic Caves by Utilizing Two-Dimensional Electrical Resistivity Imaging (ERI) Method

Fatih Uçar and Özgür Aktürk

The region consisting of easily soluble rocks is generally defined as karstic terrain and it is characterized by surface collapse and small or large scale dissolution voids on rock surface. Formation and expansion of these voids may cause dangerous situation during surface/subsurface construction works. Therefore, it is important to determine the location, size and dimension of karstic caves.
Geophysical investigations are very helpful in determining the boundaries of geological subsurface structures. In order to determine subsurface profile and characteristic of soil, surface geophysical methods can be successfully applied. Electrical Resistivity Imaging (ERI) is the most important methods among the convenient and commonly used methods to determine subsurface profile. By using this method, cavernous and weathered zones can be determined easily.
Within the scope of this study, near surface profiles were determined by utilizing ERI at Akdeniz University Campus and Masa Dağı region located in the city of Antalya, Turkey. The results obtained from four different locations in the Akdeniz University campus compared only with Vertical Electrical Sounding (VES) analyses. Since topographic cross-section is clearly seen in two different locations around Masa Dağı location, ERI results were superimposed with topography and also compared with VES. As a result, presences of subsurface cavities were determined and illustrated using 2D colorful images.

Keywords: ERI, VES, Karstic terrain, Cave, Antalya