

## **Electrical Tomography and Geological Radar Investigation: Detection and 2D Modelling of Underground Cavities in the Beni Mellal “Medina”**

**A. Najine, M. Filahi, D. El Azzab, K. Elkhammari, and M. Himi**

The collapse of underground cavities man-made or formed naturally by water flow in the “Médina” of Beni-Mellal has an impact on the existing structures on the surface. Recently several tens of buildings have been sinkhole so it was necessary to forecast the movement of the soil surface. Notable contrasts of the physical properties existing between the cavities and boxing to them offer a favourable context to characterise them by the geophysical methods. The techniques of the electrical pole-pole array and geological radar in the urban area were used. Results of the 2D electrical resistivity mapping reveal body whose top is located between 1 to 3 m depth. We interpret this body as an underground cavity according to the local context of the survey which is led on a ground including a dense network of cavities. The Res2Dinv inversion program was used to create resistivity models of the subsurface that would simulate apparent resistivities that correlate with the measured data. One of the most important results of inversion is better estimates of depth for cross-section plots, turning pseudo-sections into better approximations of the subsurface variation. In conclusion the cavities of Beni Mellal Medina have different and complex shape, located at few meters depths and are 3 to 4 m height. GPR records show two types of reflections. The first one is superficial and represents stratifications in the shallow levels of the ground. The second is deeper and more energetic. It corresponds probably to cavities interfacing. The two investigation methods are well correlated and agree with several coring at the vertical of anomalies.

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