



## **New hydrogeophysical approach to monitor the circulation of fluids in carbonate aquifer**

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Carbonate aquifer in karst systems are very important water reservoir and are recognized as the most difficult to characterize. Then, the purpose of this article is to present a PhD project aimed to understand the circulation of fluids in carbonate reservoirs through innovative hydrogeophysical methodologies both in the laboratory and in the field. In order to achieve the research objective, two phases will be analyzed. The first phase will be characterized by the realization of laboratory experiments where carbonate samples at different scale (from cm to m<sup>3</sup>) will be characterized in the time during fluid circulations by hydrogeophysical approaches in order to define an integrated modelling. The second one consists to transfer the laboratory experiences in a natural carbonate complex where a full scale test will be performed to evaluate the effectiveness of a hydrogeophysical approach for monitoring carbonate aquifer. This phase will be realized in the carbonate karst area of Castel di Lepre (Marsico Nuovo, Basilicata, Italy). Castel di Lepre karst system is disposed in the Mezo-Cenozoic carbonate substratum of the Monti della Maddalena ridge (Southern Appenines). In the karst area is located a cave, which grows in the Monti della Maddalena mountain. It has a total length of 1848 m and a depth of 146 m from the entrance. In the same karst area, an artificial tunnel (old not used train rail) is located and it will be used as a tool to characterized the fluid circulation by hydrogeophysical sensors installed inside the karst aquifer.

The first results will be presentend