



## **First hydrogeophysical controlled experiments in the large lab-scale Hydrogeosite Laboratory (IMAA-CNR).**

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The new controlled site “Hydrogeosite”, a large lab-pool (12x7x3m) situated in a steel shed in the research area of CNR-IMAA in Marsico Nuovo (Southern Italy), has been completely terminated last year. The Hydrogeosite will serve several research activities and it represents an intermediate stage between laboratory experiments and field survey. In fact, it has the advantage to obtain controlled results, like in a laboratory experiment, but at scales comparable to the field ones. The large lab-scale laboratory Hydrogeosite has been filled of homogeneous siliceous sand (95% of SiO<sub>2</sub>), which has a 87% percent of granulometry between 0.063mm to 0.125mm and a permeability of about 4.10<sup>-3</sup> cm/s. The choice of these characteristics has been necessary to conduct a base level hydrogeophysical experimentation in a homogeneous status. In order to start with the experimentation, a synthetical pumping test has been done. The simulation results gave us several information as the necessity to provide the lab-pool with a reservoirs system and 17 piezometers. The reservoirs determine the saturation of the sand to a desired height by means of a connection to a draining pipes “ring” set along the internal perimeter of the pool. Therefore, a first simple setting of the filled pool become an important step to simulate the space and time dynamics of hydraulic behaviour and to reproduce the new relationship between geophysical and hydrogeological parameters. The first experimentation consisted to make a hydraulic pumping test in order to reproduce the correlation between natural electrical field signals (Self Potential) and piezometric head data using the model proposed by Revil et al. (2003) and Rizzo et al. (2004). Finally, the obtained excellent results give us the possibility to plan several simulation of a wide spectra of hydrogeological phenomena to improve

and to find new relationship between geophysical and hydrogeological parameters, to test and to calibrate new geophysical techniques and instrumentation. Research centers interested to plan experiments in this full-scale model are welcome.