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Archaeogeophysical tests in water saturated and under water scenarios at the Hydrogeosite Laboratory

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The growing interest in underwater archaeology as witnessed by numerous archaeological campaigns carried out in the Mediterranean region in marine and lacustrine environments involves a challenge of great importance for archaeogeophysical discipline. Through a careful use of geophysical techniques it is possible support archaeological research to identify and analyse the undiscovered cultural heritage placed under water located near rivers and sea. Over the past decades, geophysical methods were applied successfully in the field of archaeology: an integrated approach based on the use of electric, electromagnetic and magnetic techniques have showed the ability to individuate and reconstruct the presence of archaeological remains in the subsoil allowing to define their distribution in the space limiting the excavation activities. Moreover the capability of geophysics could be limited cause the low geophysical contrasts occurring between archaeological structures and surrounding environment; in particular problems of resolution, depth of investigation and sensitivity related to each adopted technique can result in a distorted reading of the subsurface behaviour preventing the identification of archaeological remains. This problem is amplified when geophysical approach is applied in very humid environments such as in lacustrine and marine scenarios, or in soils characterized by high clay content that make more difficult the propagation of geophysical signals. In order to improve our geophysical knowledge in lacustrine and coastal scenarios a complex and innovative research project was realized at the CNR laboratory of Hydrogeosite which permitted to perform an archaeogeophysical experiment in controlled conditions. The designed archaeological context was focused on the Roman age and various elements characterized by different shapes and materials were placed at different depths in the sub-soil. The preliminary project activities with some scenarios were presented last year, now we would like to show the final results of the project where different scenarios were set up for GPR and ERT investigations. Severale phases were performed: buried objects were covered by different thickness of sediments and different soil water contents were defined. Moreover, geophysical measurements were acquired on an underwater scenario. The 2D and 3D acquisitions have allowed to identify the limits and the abilities of the GPR and resistivity measurements.