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Integrating geophysical and archaeological data for knowledge and management of the Historical Heritage. The case of the medieval church at Vereto (Apulia, Italy)

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The native settlement of Vereto lies at the top of a small calcareous hill near the Adriatic coast, in the southernmost part of the Salento Peninsula of Apulia region (southern Italy). Recent topographical and aero-topographical surveys carried out in the 'urban' area and in a wide sector of the surrounding territory, integrated by a thorough research of the literary and archival sources, allowed to define the long human occupation of the site between Bronze Age and the late Middle Age, and to focus the important role it played for many centuries, due to both vicinity to a commercial port and a coastal sanctuary, and its connection with the ancient road network.
Within the framework of a research project by the Department of Cultural Heritage of the Salento University, the regional Archaeological Superintendence and the local Administration, detailed analyses of the ancient settlement and of its most significant structures (city-walls, cisterns, private buildings) have been started. The attention was focused particularly on the 500th century religious building located at the hilltop and dedicated to the eponymous Holy Virgin. Here two different methods of investigation have been used. The first level of knowledge consists in geophysical surveys, that included georadar (GPR) and geoelectrical prospections. Georadar data were acquired using GSSI SIR 20 with 2 antenna simultaneously mounted on the same cart. The choice of array was determined to get a very good resolution (up to 1 meter) using an high frequency antenna (900Mhz) and to increase the investigation depth (up to 3 meters) with the medium frequency antenna (400Mhz). Data were acquired both inside and outside the religious building along two orthogonal direction (lines spaced 0.5 m), processed using Radan 6.5 software, and eventually were represented as georadar profiles and 3D time-slices and 3D volumes in order to show the distribution of anomalies with depth.
To get information at higher depth, to identify possible presence of conductive body and to compare radar data with another geophysical method, 2D geoelectrical survey were conducted outside the religious building. Data were acquired with dipole-dipole array, using Syscal Pro R10 georesistivimeter by means of 24 electrodes. The survey has been very effective in determining a semicircular anomaly outside the religious building, and some linear structures, correlated to buried walls, inside and outside of it.
The processed geophysical data were very useful in guiding the second methodology of study, based on archaeological excavation of the most interesting sites of the ancient site of Vereto. These were carried out in 2005, aimed at looking for new data about the organization of the ancient town, and at creating a touristic archaeological route among the best preserved remains. Two of these tests were carried out in the surroundings of the Holy Virgin church. Results from these excavations include the findings of many well preserved structures, at depth of a few centimetres below the ground level. These walls are likely related to two buildings, older (at least 11th century) than the still standing church. As for their size, the oldest building is the largest. They had a well preserved big apse behind the rear wall of the church. Some traces of a fresco paintings were also found on some blocks still in situ.