



Use of GPR and standard geophysical methods to explore the subsurface: Example from the Maltese Archipelago

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The aim of this work is to illustrate the results of Ground Penetrating Radar (GPR) and passive seismic measurements in selected sites in Malta. The data were gathered during a Short-Term Scientific Mission (STSM) performed under the COST Action TU1208 "Civil Engineering Applications of Ground Penetrating Radar." The purpose of the measures has been twofold, namely to test the performances of an innovative GPR system [1], recently upgraded, and to perform GPR and passive seismic analyses in several sites of interest in Malta, in order to get an insight about their geological conditions as well as about the internal status of some historical monuments.

The exploited GPR system was a prototypal stepped-frequency reconfigurable GPR, implemented by IBAM-CNR together with the University of Florence and the IDS Corporation within the research project AITECH (www.aitech.net.com/ibam.html). This system contains three equivalent couples of antennas with the same gap, achieved from two series of switches along the arms. The on and off state of the switches make equivalently longer or shorter the antennas, so to achieve efficient transmission on three bands that cover the comprehensive frequency range from 50 MHz to 1 GHz. Passive seismic techniques were used in order to gather useful data to be compared and integrated with those obtained with the GPR. Ambient noise was recorded using a three-component seismometer.

Data were gathered at the following sites a) on a cliff area close to the Golden Bay tower; b) Madliena tower; c) Laferla Cross; d) Santa Maria Church. We were able to locate and determine fractures on the cliff area as well as to locate graves and buried structures at the investigated sites.

Acknowledgement

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References

[1] R. Persico, G. Prisco, A Reconfigurative Approach for SF-GPR Prospecting, IEEE Trans. On Antennas and Prop., vol. 56, n.8, pp. 2673-2680, August 2008.