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## Microwave Tomographic approach for masonry investigation: some real results

M. Bavusi<sup>1</sup>, R. Di Napoli<sup>2</sup>, and F. Soldovieri<sup>2</sup>

<sup>1</sup>Istituto per le Metodologie di Analisi Ambientale, Consiglio Nazionale delle Ricerche, C. da S. Loja Zona Industriale, 85050 Tito Scalo (PZ), Italy

<sup>2</sup>Istituto per il Rilevamento Elettromagnetico dell'Ambiente, Consiglio Nazionale delle Ricerche, Via Diocleziano 328, 80124 Napoli, Italy

**Abstract.** Ground Penetrating Radar (GPR) is an electromagnetic technique very appreciated by the community of the archaeologist and cultural heritage end-users community thanks to its appealing features in terms of non invasivity and rapidity of measurement and diagnostics. However, GPR data requires a high operator expertise in the data processing and interpretation. In the archaeological investigation, this drawback can be mitigated by the availability of a priori information about the archaeological scenario. On the other hand, in the case of the historical heritage, when the knowledge of constructive modalities and material of the structure may be completely missed, it is necessary to undertake other strategies of processing and interpretation.

One of these can be provided by the use of novel inversion algorithms such as the Microwave Tomography (MT) which allows to reduce the subjectivity and the time consuming during the data processing. In this paper the MT was applied on raw data collected at two historical buildings of Chania (Crete, Greece). The first edifice is the Venizelo's House affected by visible fractures in its walls made up of cemented irregular stones. The second one is the headquarters of Prefecture of Chania showing some fractures along the floors. For these raw data, microwave tomography provided well detailed images which allowed to infer the fracture geometry and their extension in the host medium. This suggests microwave tomography can be a reliable complete processing tool requiring only the definition of the background scenario in terms of the dielectric permittivity and the conductivity of the host medium.

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