



Microwave tomography for an effective imaging in GPR on UAV/airborne observational platforms

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GPR was originally thought as a non-invasive diagnostics technique working in contact with the underground or structure to be investigated. On the other hand, in the recent years several challenging necessities and opportunities entail the necessity to work with antenna not in contact with the structure to be investigated. This necessity arises for example in the case of landmine detection but also for cultural heritage diagnostics. Other field of application regards the forward-looking GPR aiming at shallower hidden targets forward the platform (vehicle) carrying the GPR [1]. Finally, a recent application is concerned with the deployment of airborne/UAV GPR, able to ensure several advantages in terms of large scale surveys and “freedom” of logistics constraint [2].

For all the above mentioned cases, the interest is towards the development of effective data processing able to make imaging task in real time. The presentation will show different data processing strategies, based on microwave tomography [1,2], for a reliable and real time imaging in the case of GPR platforms far from the interface of the structure/underground to be investigated.

[1] I. Catapano, A. Affinito, A. Del Moro, G. Alli, and F. Soldovieri, “Forward-Looking Ground-Penetrating Radar via a Linear Inverse Scattering Approach,” *IEEE Transactions on Geoscience and Remote Sensing*, vol. 53, pp. 5624 – 5633, Oct. 2015.

[2] I. Catapano, L. Crocco, Y. Krellmann, G. Triltzsch, and F. Soldovieri, “A tomographic approach for helicopter-borne ground penetrating radar imaging,” *IEEE Geosci. Remote Sens. Lett.*, vol. 9, no. 3, pp. 378–382, May 2012.