

Abstract:

Microwave tomography (MWT) represents a promising tool for accurate inspections and explorations of inaccessible unknown scenarios. Thanks to its capability to interact in a non-invasive way and quantitatively characterize embedded targets, MWT is relevant to several applications. In particular, MWT has gained a great deal of attention in biomedical imaging. Such interest is motivated by evidence that human tissues exhibit different electromagnetic properties at microwaves, depending on their typology. The use of non-ionizing radiations and possibly low cost and portable devices represents the main advantage offered by MWT with respect to other medical imaging techniques. However, successful application of MWT requires to overcome the difficulties arising from the non-linearity and ill-posedness of the underlying inverse scattering problem so that many approaches have been developed in literature to pursue such a goal. In this seminar, we will discuss the difficulties underlying MWT and introduce some popular methods to counteract them. In conclusion, we will review the challenges and the advances faced by the application of microwaves in biomedical imaging.