
DANIEL FLORES, University of Manitoba

Wavefront Reconstruction Method for Microwave Imaging

In recent years, radar technology has started to being used in a wide range of subsurface imaging applications. Traditionally, linear scan trajectories were used to acquire data in most of the subsurface radar applications. However, novel applications, such as Breast Microwave Imaging, require the use of non linear scan trajectories in order to perform their data acquisition process. This paper proposes a novel reconstruction algorithm for subsurface radar data acquired along quasi-elliptical and circular trajectories. The spectrum of the collected data is processed in order to locate the spatial origin of the target reflections and remove the diffraction artifacts introduced by the scan trajectory. The effects of the antenna mainlobe beamwidth on the quality of the reconstructed images is discussed and illustrated. The proposed algorithm was tested using simulated examples and data collected from phantoms that mimic breast and cancer tissue.