JOHN FEDERICI, New Jersey Institute of Technology
Image and beam correction algorithms for THz computed Tomography Imaging

For the past decade, there has been a considerable improvement in Terahertz (THz) imaging. In particular, the technique of 3-D computed tomography has been adapted to the THz range. However, the finite refractive index of materials in the THz range can severally refract probing THz beams during the acquisition of tomography data. Due to Fresnel reflection power losses at the boundaries as well as steering of the THz beam through the sample, refractive effects lead to anomalously high local absorption coefficients near the material boundaries of a reconstructed THz tomography image. These boundary phenomena can dominate the reconstructed THz-CT images making it difficult to distinguish any hidden finer structural defect(s) inside the material. In order to eliminate boundary effects, an algorithm has been developed to remove the effects of refraction in THz-CT reconstructed images. The algorithm is successfully implemented on cylindrical shaped inhomogeneous objects.