

Object motion in tomographic imaging

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The acquisition of tomographic data takes a considerably amount of time. For example, in computerized tomography, the x-ray source has to be rotated around the investigated object. Temporal changes of the object during this time period lead to inconsistent data. Hence, the application of standard reconstruction methods causes motion artifacts in the images which can severely impede the diagnostic analysis.

To reduce the artifacts, the reconstruction method has to take into account the dynamic behavior of the specimen. Thus, the development of motion compensation algorithms is an important challenge in tomographic imaging. In addition, it is essential to understand how the object's deformation affect the overall information content within the data. For example, certain singularities of the specimen might not be gathered by the measured data, although they would be visible if the object was stationary during the scanning. Furthermore, there arises a loss in resolution compared to the stationary case. The presented talk addresses these challenges with a special focus on computerized tomography.