Imaging Performance of a Photon-Counting Computed Tomography Prototype

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Abstract

We report on the imaging performance of a research prototype for energy-resolving, photon-counting computed tomography. The prototype is based on a Philips iCT gantry with a direct-converting, semi-conductor detection system, operated in single-photon-counting mode. Each detector pixel offers energy-discrimination into a multitude of energy-bins with separate counters enabling photon-counting HU-imaging, two-material discrimination, mono-chromatic imaging as well as K-edge imaging in a very wide range of atomic numbers. We illustrate the imaging performance in terms of spatial resolution, HU-image quality and material discrimination capabilities.