

# Image Correction of Reconstructed Photon Counting CT Images Using Shot Noise

*Saturday, 18 November 2023 11:00 (15 minutes)*

X-ray CT is used in a wide range of fields, including diagnostics in the medical field and nondestructive testing in the industrial field. Among them, direct-conversion photon counting detectors are less susceptible to scattered light and have high spatial resolution. Although photon counting detectors can capture images in each energy band, it is necessary to select the corresponding energy band for observation when imaging an object that is a combination of a substance that reacts to low energy bands and a substance that reacts to high energy bands. The purpose of this study is to correct high-contrast images over a wide energy range by correcting and automatically combining multiple energy band images pixel by pixel. The correction process utilizes the shot noise found in photon-counting detectors. The original projection image data is divided into multiple energy bands, and the value that is the largest among the photon counts stored in pixels at the same location is used as the reference shot noise. Then, updating the number of photons by keeping the shot noise constant in all energy bands is repeated for all pixels in the image. The corrected projection data was reconstructed and compared to the uncorrected reconstruction to confirm the effectiveness of this method.

## Topics

Session C. Applied optics and engineering

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