

AbstractID: 11928 Title: Clinical CT Applications with Photon-Counting Detectors

Photon-counting detectors are now being introduced in medical imaging systems. A major challenge for PC detectors is to enable high count rate operation required for medical imaging. High count rate operation is now available with state-of-the-art pulse counting electronics. Pulse counting techniques can work together with direct-conversion sensors enabling additional cost and performance benefits versus indirect-conversion sensors.

PC detectors are easily configurable for multi-energy acquisitions, enabling dual and triple (k-edge) imaging techniques. The energy discrimination and binning by PC detectors competes well with the energy separation achieved with dual kVp imaging systems and provides unique performance capabilities for triple/k-edge imaging.

PC detectors have been shown to have negligible levels of electronic noise. The low noise performance enables new scanning techniques and ultimately reduces the radiation dose to the patient, an important consideration in the design of X-ray imaging systems.

This lecture will provide an overview on the use of photon-counting detectors in dual-energy CT imaging and image quality on clinical CT applications.

Learning objectives:

1. Understand the operation of direct-conversion, photon-counting detectors
2. Application of photon-counting detectors to multi-energy CT imaging
3. Use of photon counting CT system in a clinical setting