Contribution ID: **223** Type: **not specified**

INVITED: Photon-counting CT with edge-on silicon

Wednesday 29 June 2022 10:50 (30 minutes)

Photon counting detectors can enable increased spatial resolution and improved contrast and/or lower radiation dose. In particular, lower concentrations of iodine can potentially be detected and quantified, which is important in angiography or perfusion imaging. Moreover, beam hardening artefacts will disappear with material base decomposition in the projection domain. Electronic noise can be eliminated by using a minimum energy threshold that exceeds the electronic noise level, which helps with imaging of large patients and enables reduced radiation dose compared to what is possible today. So called "deep silicon"has emerged as an alternative to high Z cadmium-based compounds such as CdTe and CZT. The maturity and availability of silicon is an attractive advantage and with an edge-on geometry a high detection efficiency can be achieved. Compton interaction in the silicon can be detected as photon counts and the scattered photons is absorbed in W-foils interleaved between the silicon sensors. Moreover, the silicon sensors can be divided in depth to decrease the input x-ray flux and together with high charge carrier mobility in silicon for both electrons and holes this results in a robust x-ray sensor with low pile-up even for the high x-ray flux encountered in CT.

Presenters: DANIELSSON, Mats; DANIELSSON, Mats (KTH)

Session Classification: Applications