Abstract Submitted
for the CUWIP22 Meeting of
The American Physical Society

Evaluation of a new task-based automatic dose and keV selection tool for virtual monoenergetic imaging using a whole-body photon-counting detector CT JIA WEI, Union College, Schenectady, NY, KISHORE RAJENDRAN, JAMISON THORNE, JEFF MARSH, KRISTIN BURKE, SHUAI LENG, CYNTHIA MCCOLLOUGH, CT Clinical Innovation Center, Department of Radiology, Mayo Clinic, Rochester, MN — Computed tomography (CT) is widely used as a diagnostic imaging modality. Recently, a new CT technology called photon-counting detector (PCD) CT has been introduced for routine clinical use. In this recently introduces PCD-CT system (NAEOTOM Alpha, Siemens Healthineers GmbH, Forchheim, Germany), a new tool (CARE keV, Siemens Healthineers GmbH) is available to automatically reduce radiation dose and selects an optimal energy (keV) level for virtual monoenergetic images (VMI) based on the imaging task ($70keV$, $65keV$, $60keV$, and $55keV$ for non-contrast, calcium/bone, soft tissue with contrast (ST), and vascular tasks, respectively). We evaluated the performance of CARE keV for assessment of Contrast-to-Noise Ratio (CNR) for differnet phantom sizes and radiation dose levels compared to a conventional scan acquired at single tube potential without CARE keV. The results suggested that among all phantom sizes, average dose reduction compared to the non-contrast task ranged from 8.92% to 38.81%. Additional investigations found that $40keV$ and $50keV$ yielded similar or improved CNR for both vascular and ST task when compared to the default keV level.

Jia Wei
Union College

Date submitted: 11 Jan 2022 Electronic form version 1.4