Contribution ID: **20** Type: **Poster**

Development of a large-area multilayer detector for single-shot dual-energy imaging

Monday 25 June 2018 16:00 (1 hour)

Contrast in x-ray radiography is mainly determined by the difference between linear attenuation coefficients of target and surrounding background. Dual-energy (DE) x-ray imaging typically assumes that an object to be imaged consists of two materials. By arithmetically controlling the magnitudes of attenuation coefficients measured at two different energies, DE imaging can enhance one material intensity while suppressing the other one. Therefore, DE imaging is capable of material-of-interest imaging without background clutter. Instead of using dual shots of different x-ray energies, DE imaging is also possible with a multilayer detector at a single shot accounting for the average energy increase of x-ray photons at the rear detector layer, which are survived from the transport through the front detector layer. Although a prototype multilayer detector was limited to a small size less than a mouse, the single-shot DE technique has been successfully applied to radiography [1] and tomography [2].
In this study, we introduce a large-area multilayer detector for the single-shot DE imaging and present its initial performance. The detector consists of two phosphor-coupled CMOS photodiode arrays. To support the front detector layer as well as to include readout electronics, flexible printed circuit boards are used as a substrate. We describe development of the multilayer detector and report quantitative performance, including some demonstration images.

Author: KIM, Junwoo (School of Mechanical Engineering, Pusan National University)

Co-authors: Mr KIM, Dong Woon (School of Mechanical Engineering, Pusan National University); Mr PARK, Jiwoong (Vatech Ewoo Research Innovation Center); Mr KAM, Soohwa (Vatech Ewoo Research Innovation Center); Mr SHON, Cheol-Soon (Vatech Ewoo Research Innovation Center); Mr HEO, Sung Kyn (Vatech Ewoo Research Innovation Center); Mr KIM, Ho Kyung (School of Mechanical Engineering, Pusan National University)

Presenter: Mr KIM, Ho Kyung (School of Mechanical Engineering, Pusan National University)

Session Classification: Poster session