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Custom-made State-of-Art PET-CT or PET Imaging QA PhantomSoon Nyung Huh² W. Cho¹, Y. G. Park¹, and S. W. Ha¹¹ Department of Radiation Oncology, Seoul National University College of Medicine,² Department of Radiation Oncology, Seoul National University Hospitalmeditronic@freechal.com

Purpose: A performance phantom for PET-CT or CT scanners with motorized shaking mechanism is designed to evaluate imaging parameters of the scanner. **Methods and Materials:** The phantom consists of three parts: (1) an imaging QA phantom, (2) a motor with variable speed controller, (3) a carrier device with 2.5cm thick Lipowitz shielding well. The phantom is implemented in a 16cm-diameter * 25cm-length water container within which 2D/3D plates are contained. These plates include (a) several discs with 3cm thickness and 14cm diameter for determination of linearity and resolution, (b) cones or V-shaped structures for axial coordinate correspondence check, and (c) a long disc holder to firmly fix several discs and cone. Each disk has two small impellers in the disc edges, thus effectively shaking water while rotated by the motor with variable speed. The long holder with discs and cones is inserted onto the water container and extended out of the phantom, and connected to a motor via a plastic belt, thus making possible rotating the internal structures. A special cap is designed to minimize leakage problem. Also, the water container has a conical top in the internal cylinder housing, so air bubbles produced during rotation are pushed toward an air pocket and trapped there. The water container is placed in the shielding well. **Results:** The shaking mechanism of the PET-CT scanner (Philips Gemini scanner, UK) is evaluated with different amounts of radioisotopes (0.1 to 10mCi 18FDG). The air bubbles could not be seen during shaking mechanism. Total phantom preparation time is about 10 minute. The shielding well attenuates radiation exposure by 95%. Detailed results of imaging parameters will be presented. **Conclusion:** The phantom was very handy and effective to measure simple imaging QA in 10 minute preparation time with minimum radiation exposure.

Keywords : PET-CT Phantom, QA for PET