

ABSTRACT

Image quality plays a crucial role in radiation therapy planning, especially for CT scan modalities such as CT simulators. One of the parameters that determines image quality is CT number. This study aims to analyze and compare the accuracy of CT number values from Catphan 503 phantom images (CTP404 Module) with varying voltages using MicroDicom, ImageJ, and IndoQCT manually and automatically. ROI data containing CT number values measured by the three software programs were processed and compared with theoretical reference values to determine the level of accuracy. The results show that tube voltage variation greatly affects materials with low attenuation such as Acrylic, Delrin, Polystyrene, PMP, and LDPE. There is a direct (proportional) relationship where the CT number (HU) increases with increasing voltage (kV) because the attenuation value of these materials is dominated by the. Meanwhile, materials with low such as Teflon have an inverse relationship where the CT number (HU) value decreases as the tube voltage (kV) increases. Air materials, on the other hand, are not affected because their attenuation is close to zero, so that voltage changes do not have a significant impact. The CT number value in the Catphan 503 phantom image processed using the IndoQCT software automatically has a very high level of measurement accuracy when compared to processing using MicroDicom, ImageJ, and IndoQCT manually, as shown by the low percentage of error for each material.

Kata Kunci: *CT number accuracy, IndoQCT, MicroDicom, ImageJ*