

ABSTRACT

Detector reliability is important things that needs to be guaranteed by medical physicists so its performance does not affect on absolute dosimetry measurements of radiation output in radiotherapy. The purpose in this study is to analyse linearity of radiation output detectors in radiotherapy and to calculate the reproducibility of radiation output detectors in radiotherapy. This study was applied on Farmer IBA FC65-G and PTW TM 30013 detectors. The equipment was IBA Dose-X and PTW Unidos E electrometer, Strontium-90 (Sr-90), extension cable, stopwatch, and personal dosimeter. Measurements were done by two schemes, with extension cables and without extension cables. The charge readings by the electrometer in the time range, $t = 10 - 300$ seconds were recorded. Analysis was done on the linearity curve and calculation the value of the detector reproducibility. Farmer IBA FC65-G and PTW TM 30013 detectors had a linear response. R^2 value was equal to 1. The reproducibility value (CV) of the Farmer IBA FC65-G detector was between 0.00006 and 0.0027; While the Farmer PTW TM 30013, the reproducibility value (CV) was between 0 dan 0.00062. In this study, the PTW TM 30013 detector had more stable and precise response.

Keywords: dosimetry, farmer detector, linearity, radiotherapy, and reproducibility.