

Film dosimetry initially introduced in the early 1960's for  $^{60}\text{Co}$  teletherapy has remained an invaluable tool in radiation therapy quality assurance in this era of intensity modulated radiation therapy. In this study, we investigated the effect of spectral variation on the film characteristics. Kodak EDR2 films embedded inside a solid water phantom at depths of  $d_{\text{max}}$ , 66 mm and 116 mm, are irradiated perpendicularly over the range 50-500 MU with 6 MV photons for a 20cmx20cm field. The RIT imaging software is used to generate the characteristic curves (H&D) at the central axis (CAX) and several off-axis points: 5cm, 10cm, 10.2 and 11.5 cm from the center. Monte Carlo (MC) calculations (Penelope 2002/2003b) have also been performed for the same irradiation condition to provide an interpretation of the experimental observations. At  $d_{\text{max}}$ , the H&D curves at CAX and 5 cm off-axis are identical. At 10 cm off-axis, it is consistently lower by about 5%. On the other hand, along the CAX, the H&D curve at depth of 66 mm is identical to that at depth of 116 mm, and both are consistently lower than at  $d_{\text{max}}$ . MC calculations show that the electron fluence decreases with depth and at a given depth, the electron fluence is relatively constant spatially. Thus at larger depths, the film sensitivity decreases (i.e. the slope of the H&D curve decreases) since there are relatively fewer lower energy electrons than at shallower depths.