

Knowledge of the photon spectrum of a radiotherapy beam is needed for 3D dose calculations using Monte-Carlo (MC) and/or algorithms employing energy deposition kernels. Direct measurement of the x-ray energy fluence spectrum is not feasible for the high energy photon beams used clinically. MC simulations may be used to determine the spectrum using the manufacturers design of the target, flattening filter, accelerator head and incident electron energy, however this information may be difficult to obtain especially for older accelerators. In this report, the spectrum is extracted from basic beam data that are readily obtained for a clinical beam. We describe the photon spectrum using two parameters. One parameter, which determines the high energy portion of the spectrum, is obtained using measured dose in the build-up region for a small field where electron contamination of the incident photon beam can be neglected. The other parameter is extracted from the photon beam attenuation in water. The spectra derived for clinical beams using these parameters compare favorably to spectra generated from Monte-Carlo simulations.