

Output factor in air for megavoltage photon beams, S_c , is defined as the ratio of doses measured in a miniphantom between an arbitrary field size and a reference field, usually $10 \times 10 \text{ cm}^2$. Many irregular fields are shaped by multileaf collimators (MLC). Traditionally, S_c is measured on the central-axis for square field sizes and its value is assumed to be the same at off-axis points for the same equivalent square field size. Some publications have shown a 1 to 2 % change of S_c with off-set. This variation may reflect changes of the total headscatter-to-primary ratio as a function of offset. It is generally accepted that the dominant source of headscatter is from the flattening filter. We used a gaussian model to characterize the headscatter source (Med Phys 28, 925-937 (2001)). We examined the parameters (total head scatter-to-primary ratio, a_2 , and effective width of the headscatter source, λ) at different offset distances and concluded that there were negligible variations for the three most common types of MLC: those with MLC replacing the upper collimator jaws; those with MLC replacing the lower collimator jaws; and those with MLC as a tertiary attachment. Thus one can predict S_c for MLC shaped irregular field as accurately at off-axis points as on the central-axis, using the parameters determined on the central-axis.