

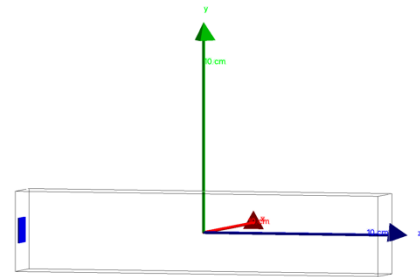
The rectangular scintillator dimensions are:

Height= 1.5 inches

Width = 1.0 inches

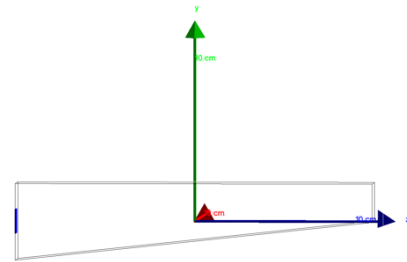
Length = 7.0 inches

Volume 10.5 cu inch



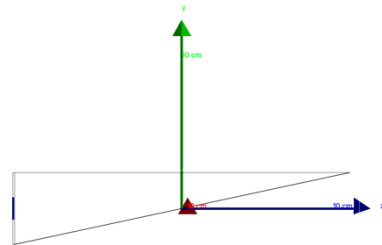
The Halfway trapezoid dimensions are similar to the rectangle with one base half the other.

Volume 7.875 cu inch, 75% the rectangle



The triangle dimension are just the rectangle cut in half diagonally through thinnest dimension.

Volume 5.25 cu inch, half the rectangle



The source was below the scintillator and aimed vertically with a small solid angle. The source was moved different distances from the SiPM. The distances started at 0.5 inch and ended at 6.5 inch. The step size was 0.5 inch.

Figure 1

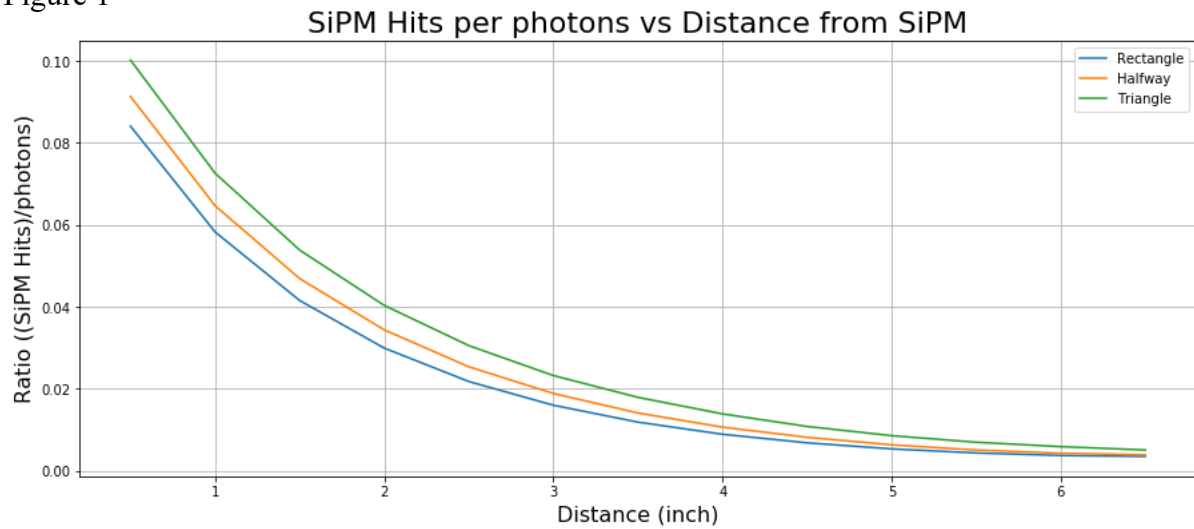


Figure 1 shows the ratio of the average SiPM hits and the number of photons created. Each run was 1e5 events. The trapezoids shapes had better efficiency. The trapezoid with of of the bases equal to zero did the best.

Figure 2

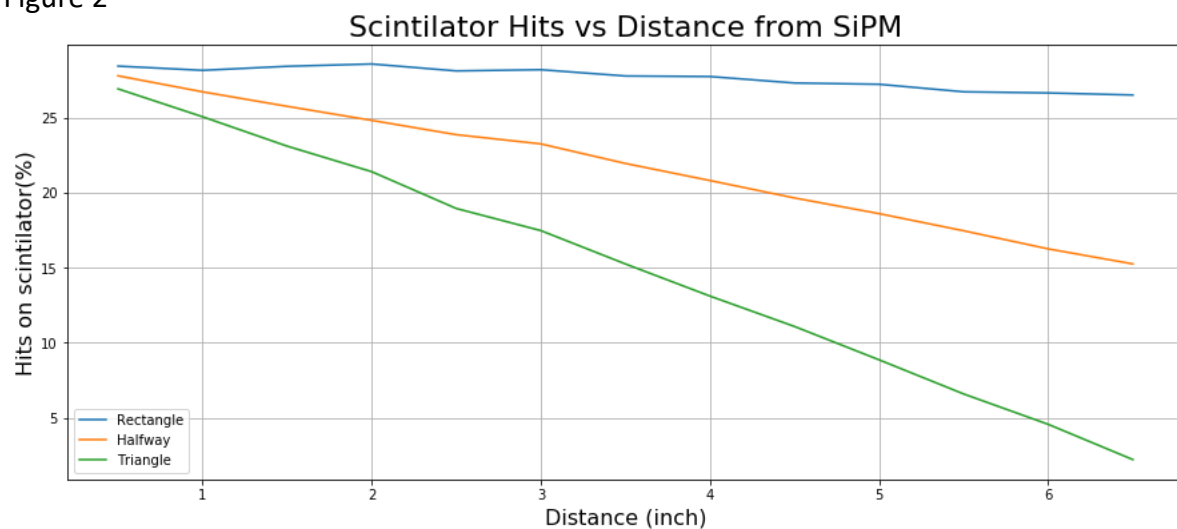


Figure 2 show the percent of gamma hits per total events. It is obvious that the thicker portions have more hits.

Figure 3

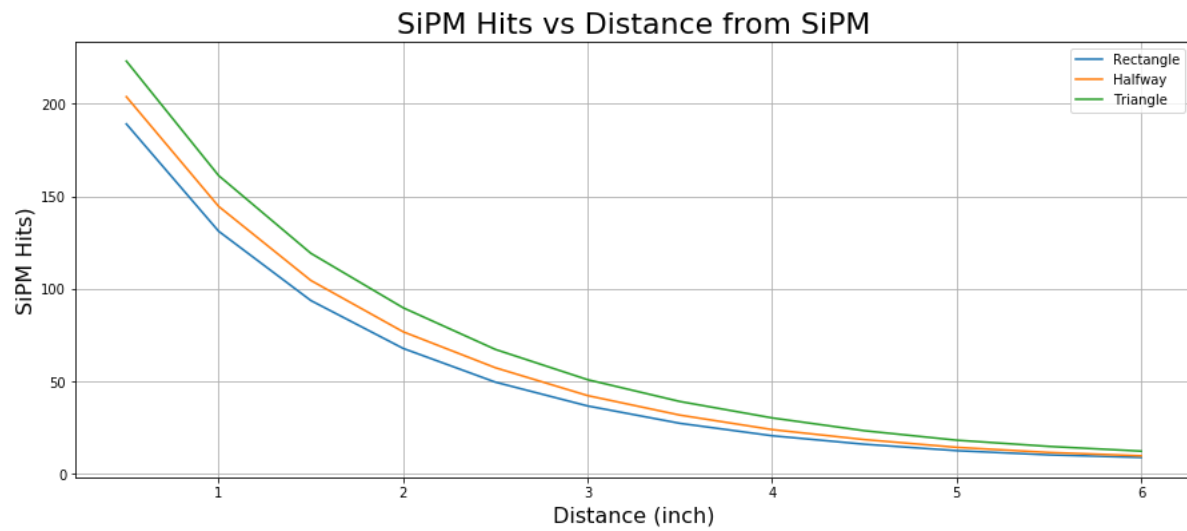


Figure 3 show the average number of SiPM hits per scintillator hit.

Figure 4

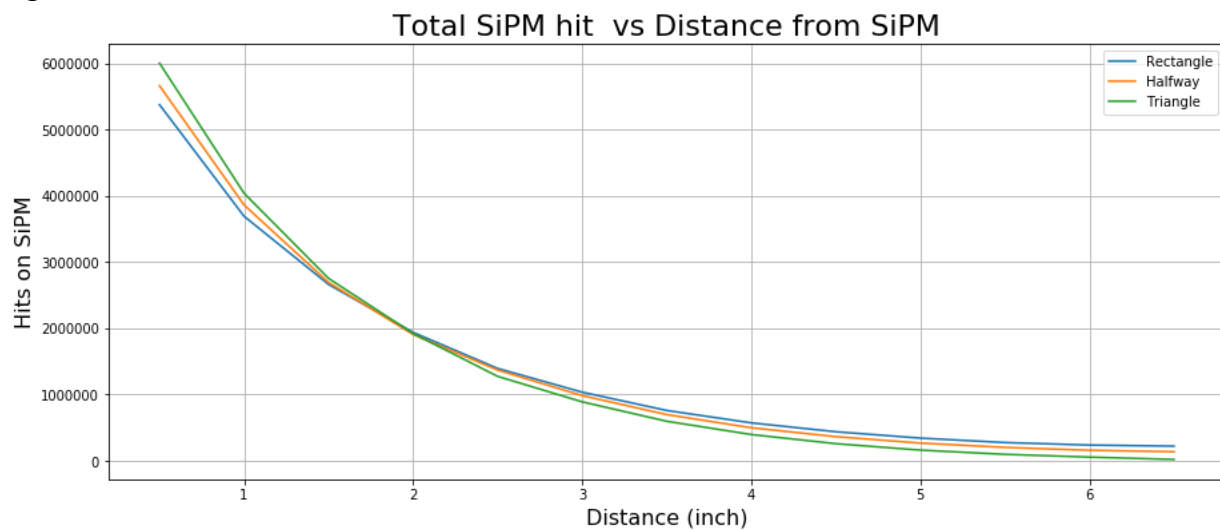


Figure 4 show total SiPM hit from  $1e5$  event vs the distance from the SiPM. Beyond 2 inches the rectangle collects more SiPM hits. It does have a considerable amount more volume to create more photons.