An updated member in the family of Silicon-based reflection trap detector

Since the beginning of the present year our production list of photodetectors was enriched. We have developed a new 3-element trap detector which is based on large-area windowless silicon photodiodes type S1337-21 from Hamatsu. The outer dimensions of the photodiodes are 25,4 x 25,4 mm with the active area of 18x18 mm.

As it is our business, we have designed the trap detector as compact as possible: the outer diameter is 80 mm and the length of the housing is 66 mm with BNC connector (Figure 1).

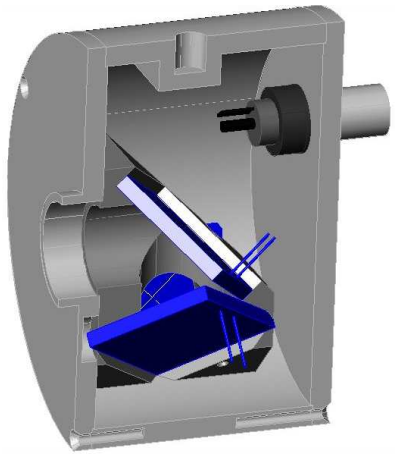

Figure 1. Schematic cross-section of the large-area photodiode trap detector HHL03-S1337. Photodiodes are seen in blue colour.

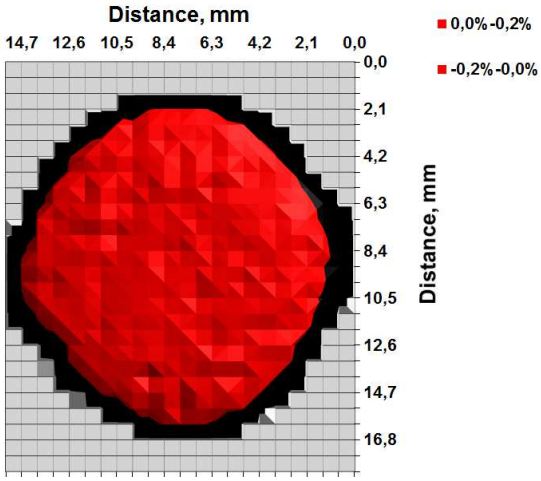

Figure 2. The active area of the trap detector HHL03-S1337 measured at 633-nm laser wavelength.

The compact design assures the shortest optical path length of 99 mm providing large field of view 18 °. As compared to the ordinary small-area photodetector, the active area of the large-area reflection photodetector is more than 3 times larger, ie 183 mm (Figure 2).

Owing to fruitful co-operation with Chinese and Korean colleagues the performance of the new trap detector HHL03-S1337 was tested in the visible wavelength range. The results were as good as for the conventional trap detector consisting of small-area photodiodes. Both, the reflectance and the responsivity values are comparable to those of small-area 3-element trap detector based on windowless photodiodes type S1337-11 from Hamamatsu.

As an example, the calculated responsivity values are compared to those of measured values in the wavelength range from 457 nm to 950 nm in Figure 3.

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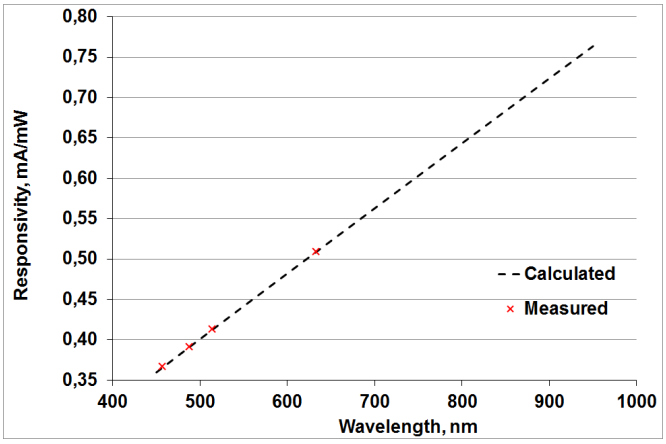

Figure 3. Responsivity of the large-area photodiode trap detector HHL03-S1337.

The new large-area trap detector exhibits excellent reflectance, as well as, responsivity modelling properties and is very useful in weak radiation measurements emitted in large beams.